Vol. 898 Number 4

OFFICIAL GAZETTE

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PATENTS

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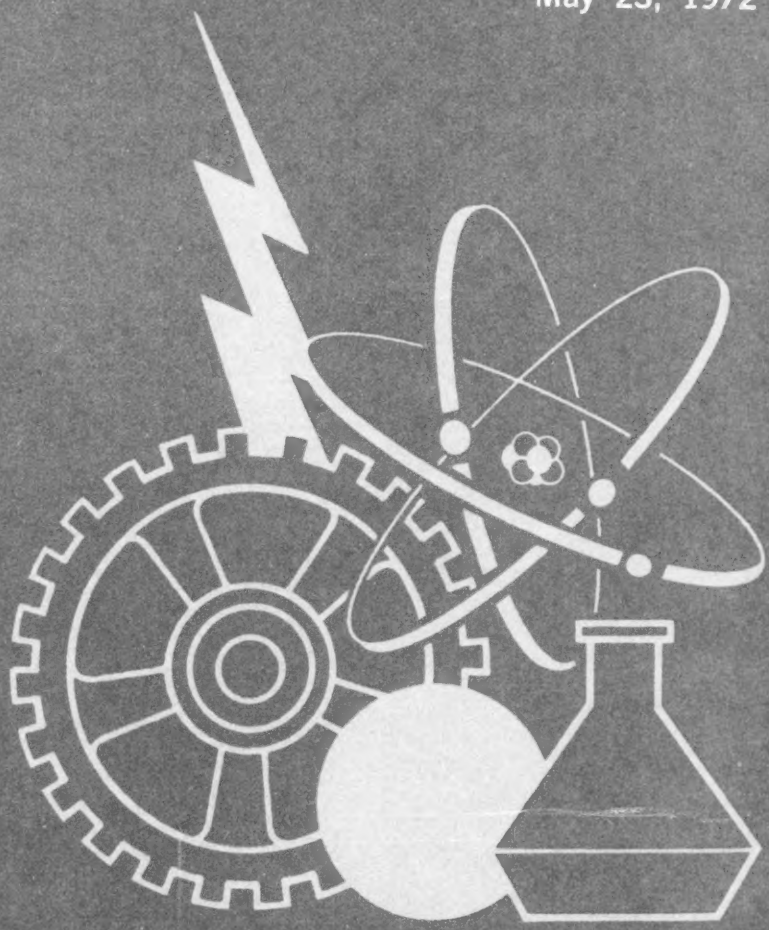

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OFFICIAL GAZETTE of the UNITED STATES PATENT OFFICE

May 23, 1972 Volume 898 Number 4

CONTENTS

	Page
Issue of May 23, 1972	1107
Patents and Trademark Notices	
Examination	1108
Registration to Practice	1108
Patent Suits	1108
Patent Notices	
Certificates of Correction for the Week of May 23, 1972	1110
Patents Available for Licensing or Sale	1110
Condition of Patent Applications	1113
Plant Patents Granted	1114
Patents Granted	
General and Mechanical	1116
Chemical	1325
Electrical	1377
Design Patents Granted	1490
Index of Patentees	PI 1
Indices of Plants and Designs	PI 45
Classification of	
Patents (Including Reissues)	PI 47
Designs and Plants	PI 50
Geographical Index of Residence of Inventors	
Patents (Including Reissues)	PI 51
Designs and Plants	PI 53

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PATENT OFFICE NOTICES

Examination

Pursuant to the provisions of Rule 341(c), an examination for persons seeking registration before the United States Patent Office as patent attorneys or agents will be held on Tuesday, September 12, 1972.

With the exception of those former patent examiners for whom the examination is waived, all persons recognized for practice before the Patent Office in patent cases must, pursuant to the noted rule, pass the examination. Those passing the examination do not thereby qualify for recognition for practice before the Patent Office in trademark cases. Recognition for practice in trademark cases is governed by Rule 2.12 of the Trademark Rules of Practice, which does not require the passing of an examination.

The examination will be given under the supervision of the Civil Service Commission, and may be taken in any of the cities in which the Civil Service Commission regularly conducts examinations. Applications to take the examination must be filed in the Patent Office together with a $35 fee not later than August 7, 1972.

Application blanks may be obtained from the Clerk of the Patent Office Committee on Enrollment, Bldg. 3, 11th Floor, Room C16, Crystal Plaza, Arlington, Va., or by mail addressed to the Commissioner of Patents, Washington, D.C., 20231, and directed to the attention of the Clerk of the Committee on Enrollment.

LUTRELLE F. PARKER,
Chairman, Committee on Enrollment.

Registration to Practice

The following list contains the names of persons applying for registration to practice before the United States Patent Office either on the basis of 4 years or more service in the Examining Corps or under Rul 341(e) of the "Rules of Practice of the United States Patent Office in Patent Cases."

Information tending to affect the eligibility of said applicants on moral, ethical, or other grounds should be furnished the Commissioner of Patents on or before June 12, 1972.

Dubuc, Jean H., Place de la Savane 4996, Montreal 308, Quebec, Canada

French, Philip M., 59 W. 74th St., #4A, New York, N.Y. 10023

Payne, Leslie J., Suite 800, 1801 K St., NW., Washington, D.C. 20006

Sklar, Warren A., 601 Rockwell, Cleveland, Ohio 44114

LUTRELLE F. PARKER,
Chairman, Committee on Enrollment.

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,818,602, R. W. Bernstein, ABRASIVE GRINDING WHEEL, **filed** Nov. 30, 1971, D.C., N.D. Ohio (Cleveland), Doc. C–71–1179–Y, *Merit Abrasive Products, Inc.* v. *Bison Corporation.*

3,032,054, D. W. Irwin, PRESSURE REGULATOR CONSTRUCTION, **filed** Dec. 7, 1971, D.C., S.D. Iowa (Des Moines), Doc. 11–447–C–1, *Rockwell Manufacturing Company* v. *Fisher Controls, Inc.*

3,051,894, D. F. Fathauer, IMPEDANCE INDICATING INSTRUMENT, **filed** Feb. 24, 1970, D.C., N.D. Ill. (Chicago), Doc. 70c439, *Eaton, Yale and Towne, Inc.* v. *Overton Corporation.* Judgment order-counterclaim be and hereby dismiss with prejudice to defendant-counterclaimant and/or its successor. Plaintiff-counterdefendant recover costs of defending this counterclaim, Nov. 2, 1971.

3,000,050, Fraser and McLean, EYE AND FACE WASH, **filed** Dec. 30, 1971, D.C., N.D. Ill. (Chicago), Doc. 71c3136, *Speakman Co.* v. *Water Saver Faucet Co., Inc.*

3,129,456, L. C. Renfroe, METHOD OF EVISCERATING SCALLOPS, **filed** Oct. 29, 1971, U.S. Court of Appeals, Fourth Circuit (Richmond), Doc. 71–1998, *Calico Scallop Corporation and Slade Gorton & Company* v. *Willis Brothers, Inc. and Elmer D. Willis.*

3,166,154, J. M. Titzel, PORTABLE SCAFFOLDS AND WORK TOWERS, **filed** Nov. 23, 1970, D.C., W.D. Pa. (Pittsburgh), Doc. 70–1333, *Titzel Engineering Co., Inc.* v. *M & G Industrial Associates, Inc. and Robert N. Munroe.* Defendants infringed said patent, Oct. 15, 1971.

3,168,900, Zurbrigen and Steinsberger, METHOD FOR LOCATING AND SEALING PIPE LEAKS, **filed** May 20, 1970, D.C., S.D. Fla. (Miami), Doc. 70–711–C–JLK, *The Penetryn System, Inc.* v. *Dick Burns, Inc.* On joint stipulation, ordered and adjudged complaint be and is hereby dismissed with prejudice, Oct. 26, 1971.

3,199,840, L. E. Lindsey, CONVERTIBLE STRINGING BLOCK ASSEMBLY, **filed** Sept. 12, 1969, D.C., E.D. Tenn. (Chattanooga), Doc. 5696, *L. E. Lindsey* v. *Sherman and Reilly, Inc.* Judgment held invalid as to claims 4, 6, 7 and 8, Nov. 12, 1971.

3,286,929, R. W. Henningsen, OSCILLATING SPRINKLER, **filed** Nov. 11, 1971, D.C., C.D. Calif. (Los Angeles), Doc. 71–2705–ALS, *W. D. Allen Manufacturing Co.* v. *The Leisure Group, Inc.*

3,297,155, Gattenby, D'Amato, Golner and Feinstein, TUBULAR CORES, **filed** Nov. 15, 1971, D.C., E.D. Pa. (Philadelphia), Doc. C.A. 71–2780, *Bordon, Inc.* v. *The Goodyear Tire and Rubber Co.*

3,323,312, M. P. Banjavich, DIVING BELL AND DECOMPRESSION VESSEL COMBINATION AND IMPROVED METHOD FOR HANDLING DIVING PERSONNEL, **filed** May 31, 1966, D.C. Md. (Baltimore), Doc. 17339, *Mark P. Banjavich and Taylor Diving & Salvage Co.* v. *Westinghouse Electric Corporation (Undersea Division).* Stipulation of counsel filed Nov. 4, 1971 dismissnig all claims and counterclaims entered, Nov. 8, 1971.

3,326,692, Martino and Blaese, METHOD OF AND APPARATUS FOR COOKING, **filed** Aug. 27, 1971, D.C. Conn. (Bridgeport), Doc. B–350–C, *Food-Automation Service-Techniques, Inc.* v. *McDonald's Corporation et al.*

3,329,852, Saussele and Menzel, DIRECT-CURRENT MOTOR WITH PERMANENT-MAGNET ROTOR AND SEQUENTIALLY ENERGIZED STATOR WINDINGS, **filed** Aug. 18, 1971, D.C.N.J. (Newark), Doc. C. 1241–71, *Gebr. Buehler Nachfolger GmbH, etc.* v. *Siemens-Schuckertwerk Aktiengesellschaft, etc.* Notice of dismissal, Nov. 15, 1971.

3,339,366, Gogan and Joly, STRUCTURE FOR LEACHING FIELDS, **filed** Nov. 2, 1971, D.C. Vt. (Burlington), Doc. 6425, *American Precast Corporation* v. *Adams, McNichol and Melen, Inc.*

3,343,961, H. Truax, METHOD FOR TREATING SOYBEANS AND THE LIKE USING INFRA-RED HEAT, **filed** Oct. 23, 1970, D.C., N.D. Iowa (Cedar Rapids), Doc. 70–C–29–CR, *Mix-Mill, Inc., and Harry Truax & Sons Company, Inc.* v. *Simonsen Iron Works, Inc.* Dismissed on motion of parties, Feb. 22, 1971.

3,354,049, V. W. Christensen, DRY STARTER COMPOSITION, **filed** Nov. 1, 1971, D.C., E.D. Wis. (Milwaukee), Doc. 71–C–569, *Miles Laboratories, Inc.* v. *Juneau Laboratories, Inc.*

3,396,342, A. E. Feinberg, POWER SUPPLY CIRCUIT FOR CONTINUOUS WAVE MAGNETRON OPERATED BY PULSED DIRECT CURRENT, **filed** Oct. 28, 1971, D.C., N.D. Ill. (Chicago), Doc. 71c2593, *Advance Transformer Co.* v. *Polk Bros.*

3,413,127, Schwall and Rogers, METHOD OF PREPARING A POULTRY PRODUCT, **filed** Aug. 5, 1969, D.C., N.D. Ill. (Chicago), Doc. 69c1635, *Armour and Company* v. *Swift & Company.* Filed stipulation of dismissal granted, May 12, 1971.

3,416,763, A. M. Moreno, DEVICE FOR TENSIONING STRAPS, WIRES, OR LIKE FLEXIBLE ELEMENTS, filed Jan. 7, 1972, D.C., M.D. Fla. (Jacksonville), Doc. 72-10-C-J, *Albert M. Moreno* v. *W. C. Tyson, doing business as Northeast Florida Mobile Home Anchors.*

3,522,814, G. R. Olson, WASHER FOR PARTS AND THE LIKE, filed Aug. 17, 1971, D.C., W.D. Wash. (Seattle), Doc. 88-71C2, *Safety-Kleen Corporation* v. *Roger L. Sortino, doing business as Easy Clean Corporation.* Filed consent decree; defendant not to infringe, Oct. 27, 1971.

3,534,490, D. P. Herbert, SECTION FRAME, filed Jan. 5, 1972, D.C., E.D.N.Y. (Brooklyn), Doc. 72C24, *Structural Industries, Inc.* v. *Gerson Enterprises.*

3,556,291, D. W. Kosterka, PHONOGRAPH RECORD ALBUM PACKAGE, filed Apr. 5, 1971, D.C., S.D.N.Y., Doc. 71-C-1521, *Album Graphics, Inc.* v. *Buddah Records, Inc.* Stipulation and order action be dismissed with prejudice, Sept. 10, 1971.

Re. 28,950, Bloch and Hansen, METHOD AND MEANS FOR CHEMICAL ANALYSIS BY NUCLEAR INDUCTIONS, filed Dec. 4, 1968, D.C.N.J. (Camden), Doc. C-1278-68, *Eugene J. Levy et al.* v. *Varian Associates.* Consent order of dismissal, with prejudice, Dec. 17, 1971.

Re. 25,406, Byrne and Cruger, AIRCRAFT ARRESTING SYSTEM, filed Dec. 29, 1964, D.C., W.D.N.Y. (Buffalo), Doc. C-11,234, *E. W. Bliss Company* v. *Buffalo Weaving & Belting Company.* Order of dismissal filed Nov. 5, 1971.

Re. 26,220, L. R. Records, METHOD AND APPARATUS FOR WELL CONTROL, filed Jan. 17, 1968, D.C., S.D. Tex. (Houston), Doc. 68-H-52, *Drilling Well Control, Inc.* v. *Dresser Industries, Inc.* Judgment, claims 4, 18, 20 and 21 valid; claim 13 invalid; defendant's manufacture, use and sale of its apparatus and the practice of its method here in controversy, has not been and is not an infringement of any of claims 4, 13, 18, 20 and 21, Dec. 30, 1971.

D. 192,510, W. F. Stembridge, TAIL FOR FISHING LURE, filed Dec. 9, 1971, D.C. La. (Shreveport), Doc. 17407-S, *Stembridge Products Inc.* v. *Championship Tackle, Inc., Doyle Wise and Hugh O. Rinkle.*

D. 209,771, G. Saltzman, DIAMOND, filed Nov. 23, 1971, D.C., S.D.N.Y., Doc. 71-C-5119, *George Saltzman and Joseph Waldman* v. *Harry W. Lieb.*

D. 212,372, Trimble and Rottman, GOAL POST, filed Dec. 28, 1971, D.C., M.D. Fla. (Tampa), Doc. 71-574-C, *Triman Tele-Goal, Inc.* v. *Pinellas County School Board et al.*

D. 220,911, C. McGrady, TRANSPARENT BOOK STAND, filed Dec. 7, 1971, D.C., S.D.N.Y., Doc. 71-C-5339, *Corinne McGrady* v. *Dione Lucas.*

D. 220,925, H. Boomer, BOAT DECK, filed Dec. 23, 1971, D.C., M.D. Fla. (Orlando), Doc. 71-269-Orl-C., *Gemini Marine, Inc.* v. *Helios Marine Inc. and Ronald E. Alberty.*

D. 221,893, C. M. Peasley, BATTERY POWERED LIGHTING FIXTURE FOR WALL, CEILING OR THE LIKE, filed Dec. 17, 1971, D.C. Mass. (Boston), Doc. 71-3028-F, *Curtiss M. Peasley* v. *Chadwick-Miller, Inc.*

Certificates of Correction for the Week of May 23, 1972

Re. 27,133	3,598,662	3,620,671	3,623,932
3,344,108	3,599,878	3,620,721	3,623,966
3,471,452	3,600,642	3,620,732	3,624,052
3,500,461	3,600,893	3,620,740	3,624,073
3,501,485	3,600,922	3,620,741	3,624,091
3,511,960	3,601,322	3,620,742	3,624,131
3,539,556	3,602,024	3,620,759	3,624,276
3,541,458	3,602,309	3,620,782	3,624,424
3,551,412	3,602,323	3,620,790	3,624,432
3,552,561	3,602,553	3,620,802	3,624,442
3,552,652	3,602,855	3,620,805	3,624,454
3,556,229	3,603,143	3,620,820	3,624,471
3,556,667	3,603,182	3,620,829	3,624,630
3,562,059	3,604,482	3,620,901	3,624,802
3,562,226	3,606,187	3,620,927	3,624,988
3,565,852	3,607,509	3,620,943	3,625,029
3,568,726	3,608,232	3,620,970	3,625,263
3,569,815	3,608,326	3,620,971	3,625,387
3,570,006	3,608,675	3,620,974	3,625,493
3,571,582	3,608,922	3,620,981	3,625,842
3,571,743	3,609,024	3,620,989	3,625,860
3,573,334	3,609,983	3,620,991	3,625,910
3,574,516	3,610,026	3,621,003	3,625,911
3,575,434	3,611,369	3,621,004	3,625,958
3,575,792	3,611,858	3,621,007	3,626,001
3,576,785	3,612,461	3,621,016	3,626,043
3,577,187	3,614,583	3,621,022	3,626,450
3,577,259	3,615,228	3,621,029	3,626,577
3,577,536	3,615,652	3,621,039	3,626,868
3,577,901	3,615,741	3,621,044	3,626,908
3,579,557	3,615,746	3,621,045	3,627,013
3,581,941	3,616,066	3,621,047	3,627,089
3,583,726	3,616,216	3,621,063	3,627,409
3,583,970	3,617,189	3,621,090	3,627,709
3,584,742	3,617,497	3,621,092	3,627,715
3,584,942	3,618,132	3,621,102	3,627,761
3,585,399	3,618,467	3,621,171	3,628,003
3,585,567	3,618,614	3,621,180	3,628,279
3,585,915	3,618,732	3,621,264	3,628,408
3,586,292	3,618,972	3,621,274	3,628,499
3,586,523	3,619,215	3,621,284	3,628,589
3,586,872	3,619,274	3,621,301	3,628,937
3,586,966	3,619,350	3,621,333	3,628,962
3,587,054	3,620,077	3,621,347	3,629,280
3,588,806	3,620,223	3,621,373	3,629,408
3,588,818	3,620,243	3,621,375	3,629,824
3,589,077	3,620,288	3,621,390	3,630,354
3,589,173	3,620,292	3,621,394	3,630,408
3,589,225	3,620,332	3,621,401	3,630,779
3,589,858	3,620,350	3,621,421	3,630,821
3,590,053	3,620,353	3,621,446	3,631,111
3,590,071	3,620,404	3,621,552	3,631,434
3,590,490	3,620,437	3,621,640	3,631,623
3,591,498	3,620,454	3,622,062	3,631,716
3,591,541	3,620,473	3,622,202	3,631,844
3,591,638	3,620,476	3,622,333	3,631,870
3,591,920	3,620,481	3,622,452	3,632,004
3,592,629	3,620,486	3,622,465	3,632,010
3,593,193	3,620,488	3,622,521	3,632,026
3,593,231	3,620,521	3,622,538	3,632,074
3,593,508	3,620,532	3,622,568	3,632,094
3,593,806	3,620,546	3,623,010	3,632,145
3,594,417	3,620,571	3,623,055	3,632,862
3,595,438	3,620,584	3,623,064	3,633,560
3,595,471	3,620,592	3,623,159	3,634,474
3,596,034	3,620,632	3,623,795	
3,596,308	3,620,670	3,623,860	

Patents Available for Licensing or Sale

D. 198,860. SKIN DIVER'S HAND RAKE. J. Fedorka, 193 E. High St., Somerville, N.J., 08876.

2,995,619. SYSTEM OF TELEVISION TRANSMISSION AND PHOTOGRAPHIC REPRODUCTION OF THE TELEVISED IMAGE. Samuel Freeman, 13 Birchwood Court, E., Syossett, N.Y., 11791.

3,525,099. HAND GUIDED WALK-BEHIND SELF-PROPELLED MATERIAL CONVEYING CART. John Fuhrmann. Correspondence to: Robert C. Weber, 1022 Ellicott Square, Buffalo, N.Y. 14203.

3,568,259. TYING CLIP. Paul Gaudlitz, Hamburg, Germany. Correspondence to: Michael S. Striker, 360 Lexington Ave., New York, N.Y., 10017.

3,570,507. ICE FISHING TENT. Morris Kashuba, 1563 Main St., Peckville, Pa., 18452.

3,625,664. PROCESS FOR THE PRODUCTION OF RICH FUEL TO REPLACE NATURAL GAS BY MEANS OF CATALYTIC HYDROGASIFICATION UNDER PRESSURE OF FLUID HYDROCARBONS. Carlo Padovani. Correspondence to: Murphy & Dobyns, 2001 Jefferson Davis Highway, Suite 307, Arlington, Va., 22202.

3,635,265. DUAL ACTION COPYING LATHE. Jose L. Cortez, 9050 E. Jeff St., Bellflower, Calif., 90706.

3,641,682. HAIR DRYER WITH REMOVABLE LAY ON RESILIENT CUSHION. Georgia E. Glintz, 2909 University Ave., Des Moines, Iowa, 50311.

3,649,018. BLOCK ASSEMBLY GAME. Danny J. Beam, Box 64, Lockport, Ill., 60441.

3,652,508. VISCOSITY STABLE ALIPHATIC POLYURETHANE COMPOSITIONS AND METHOD OF PREPARATION. Donald L. Segur, et al. Correspondence to: Henry B. Townsend, General Latex and Chemical Corp., Research Center, High St., North Billerica, Mass., 01862.

3,659,896. APPARATUS FOR MAKING CONCRETE PRODUCTS. Nathan L. Gelbman. Correspondence to: Henry E. Lippert, 130 SE. 12th St., Miami, Fla., 33130.

Cerebro-Dynamics, Inc., offers to sell or license the following 2 patents on reasonable terms.

Inquiries should be directed to: Richard L. Bohanon, Cerebro-Dynamics, Inc., 1405 City National Bank Tower, Oklahoma City, Okla., 73120.

3,592,006. ISOLATION DEVICE.

3,653,215. METHOD AND APPARATUS FOR CONFINING AND COLLECTING OIL LEAKAGE.

General Motors Corporation is prepared to grant non-exclusive license under the following patent upon reasonable terms.

Applications for license may be addressed to: The Director, Patent Section, General Motors Building, 3044 W. Grand Blvd., Detroit, Mich., 48202.

3,473,477. ROTARY PUMP.

The RCA Corporation offers to grant non-exclusive licenses on reasonable terms and conditions under the following 42 patents.

Inquiries respecting licenses under the following patents should be addressed to RCA Corporation, Staff Vice President, Domestic Licensing, 1133 Avenue of Americas, New York, N.Y., 10036.

3,649,887. AC LINE OPERATION OF MONOLITHIC CIRCUIT.

3,649,901. HIGH VOLTAGE HOLD-DOWN CIRCUIT.

3,649,937. ELECTRONICALLY TUNED ULTRA HIGH FREQUENCY TELEVISION TUNER.

3,650,595. REDUNDANT, SPECKLE-FREE HOLOGRAM RECORDING APPARATUS.

3,650,603. LIQUID CRYSTAL LIGHT VALVE CONTAINING A MIXTURE OF NEMATIC AND CHOLESTRIC MATERIALS IN WHICH THE LIGHT SCATTERING EFFECT IS REDUCED WHEN AN ELECTRIC FIELD IS APPLIED.

3,651,250. TELEVISION CAMERA UTILIZING A PARALLEL STRIPED COLOR ENCODING FILTER.

3,651,328. BOWLING PIN DETECTOR.

3,651,339. FEEDBACK CLIPPER.

3,651,342. APPARATUS FOR INCREASING THE SPEED OF SERIES CONNECTED TRANSISTORS.

3,651,346. ELECTRICAL CIRCUIT PROVIDING MULTIPLE V(SUB)BE BIAS VOLTAGES.

3,651,347. SIGNAL TRANSLATING STAGE PROVIDING DIRECT VOLTAGE TRANSLATION INDEPENDENT OF SUPPLIED OPERATING POTENTIAL.

3,651,409. ELECTRONICALLY TUNED ULTRA HIGH FREQUENCY TELEVISION TUNER WITH FREQUENCY TRACKING TUNABLE RESONANT CIRCUITS.

3,651,418. SYNCHRONOUS DETECTOR CONTROL.

3,651,419. PEAK DEMODULATOR.

3,651,421. GATED AMPLIFIER.

3,651,488. INFORMATION STORAGE SYSTEM EMPLOYING OPTICAL ENTRY AND REMOVAL OF INFORMATION.

3,652,323. PROCESS FOR COATING FLATLIKE SURFACES.

3,652,938. DUAL LOOP RECEIVER TUNING AND FREQUENCY TRACKING SYSTEM.

3,653,054. SYMMETRICAL TROUGH WAVEGUIDE ANTENNA ARRAY.

3,653,056. COMBINED VHF-UHF DIPOLE ANTENNA ARRAY.

3,646,666. FABRICATION OF SEMICONDUCTOR DEVICES.

3,647,280. LIQUID CRYSTAL DISPLAY DEVICE.

3,647,438. METHOD OF MAKING HIGH AREA-DENSITY ARRAY PHOTOMASKS HAVING MATCHING REGISTRY.

3,647,579. LIQUID PHASE DOUBLE EPITAXIAL PROCESS MANUFACTURING LIGHT EMITTING GALLIUM PHOSPHIDE DEVICES.

3,647,940. CONTROL SYSTEM.

3,647,944. KINESCOPE BIAS ARRANGEMENT TO PROVIDE BOTH CONSTANT AMPLITUDE D.C. RESTORATION PULSES AND ARC DISCHARGE PROTECTION.

3,647,945. COLOR ENCODING SYSTEM UTILIZING TWO FILTERS ALTERNATELY FOR MINIMIZING EFFECTS OF IMAGE MISREGISTRATION AND IMAGE PICKUP DEVICE LAG.

3,647,952. AUTOMATIC BEAM FOCUSING SYSTEM.

3,657,965. COLOR PHASER FOR TELEVISION VIDEO SIGNALS.

3,648,116. MULTICIRCUIT HYBRID MODULE AND METHOD FOR MAKING.

3,648,135. REMOTE CONTROLLED TELEVISION TUNER MOTOR SWITCHING CIRCUIT.

3,648,153. REFERENCE VOLTAGE SOURCE.

2,648,167. FLUID COOLED APPARATUS FOR TESTING POWER SEMICONDUCTOR DEVICES.

3,648,197. MICROWAVE LIMITER THAT SUPPRESSES LEADING EDGE SPIKE OF RADIO FREQUENCY SIGNALS.

3,648,279. MULTI-ELECTRODE TRANSDUCER ELEMENT.

3,649,309. DARK FOSTERITE CERAMIC COMPOSITION.

3,649,382. DOUBLE EPITAXIAL SOLUTION REGROWTH PROCESS AND DEVICE MADE THEREBY.

3,649,749. APPARATUS PERMITTING RELIABLE SELECTION OF TRANSMITTED TELEVISION MESSAGE INFORMATION.

3,649,750. CONTROL SIGNAL GENERATING APPARATUS TO PERMIT RELIABLE SELECTION OF TRANSMITTED TELEVISION MESSAGE INFORMATION.

3,649,847. ELECTRICALLY CONTROLLED ATTENUATION AND PHASE SHIFT CIRCUITRY.

3,649,848. VOLTAGE TRANSLATION CIRCUIT FOR MNOS MEMORY ARRAY.

3,649,881. HIGH POWER SEMICONDUCTOR DEVICE ASSEMBLY.

Vereinigte Flugtechnische Werke-Fokker Gesellschaft mit beschrankter Haftung, is prepared to grant licenses under the following 24 patents upon reasonable terms.

Applications for license may be addressed to: Ralf H. Siegemund, 4262 Wilshire Blvd., Suite 320, Los Angeles, Calif., 90010.

3,084,888. IMPROVEMENT IN OR RELATING TO VTOL AIRCRAFT.

3,150,784. DISPLACEABLE LIFTING PLATFORM FOR AUTOMOTIVE VEHICLES.

3,223,251. DISPLACEABLE JACK FOR AUTOMOTIVE VEHICLES.

3,223,354. VERTICAL TAKE OFF AND LANDING AIRCRAFT.

3,223,360. VTOL AIRCRAFT JET INSTALLATION.

3,276,547. STATIONARY HYDRAULIC LIFTING APPARATUS.

3,277,848. LOADING PALLETTS.

3,443,777. REGULATING ARRANGEMENT FOR AIRCRAFT.

3,455,523. AIRCRAFT TAIL.

3,462,099. VTOL AIRCRAFT.

3,476,336. BODY FOR FLIGHT AT HIGH SUBSONIC SPEED.

3,486,721. AIRCRAFT CLOSURE FLAPS.

3,506,223. AIRPLANE WITH AT LEAST ONE LIFTER DRIVING.

3,509,800. PORTABLE GROUND COVER FOR STARTING AND LANDING SURFACES FOR VERTICALLY AND SHORT-STARTING AND LANDING VEHICLES.

3,520,636. CONTROL MECHANISM FOR HELICOPTERS.

3,525,485. FLIGHT CONTROL FOR VERTICALLY STARTING AND LANDING MULTI-ENGINE AIRPLANES.

3,532,306. DEVICE FOR MAINTAINING EQUILIBRIUM OF THE MOMENTS AROUND THE TRANSVERSE AXIS OF AN AIRPLANE.

3,537,464. DEVICE FOR DISPLACING THE FRONT PORTION OF AN AIR INLET OF JET VALVES.

3,545,795. JOINT.

9,552,880. BLADE CONNECTION FOR HELICOPTERS.

3,578,263. VERTICALLY STARTING AND LANDING AIRPLANE.

3,581,995. DEVIATING DEVICE FOR PARTICULARLY HOT EXHAUST GAS JETS OF AIR VEHICLE DRIVING MECHANISMS.

3,580,531. RETRACTABLE MAIN CARRIAGE FOR VERTICALLY STARTING AIRPLANES AND AIRPLANES STARTING ON A SHORT RUNWAY.

3,651,704. ARRANGEMENT OF THE OPENINGS TO LOADING COMPARTMENTS IN VERTICAL TAKE OFF AND LANDING AIR VEHICLES.

General Electric Company is prepared to grant non-exclusive licenses under the following 53 patents upon reasonable terms to domestic manufacturers.

Applications for license under the following 12 patents may be addressed to: Patent Counsel, Major Appliance Business Group, General Electric Co., Appliance Park, Louisville, Ky., 40225.

3,373,576. SINGLE EVAPORATOR, SINGLE FAN REFRIGERATOR INCLUDING CONTROL MEANS.

3,618,148. HEAT SHRINK METHOD OF FACILITATING THE DISPOSAL OF TRANSFER AGENT.

3,621,165. CLOSURE-OPERATED SAFETY SWITCH FOR AUTOMATIC APPLIANCE.

3,621,293. ELECTRONIC DRYER CONTROL.

3,621,668. REFRIGERATOR INCLUDING AN AUTOMATIC ICE MAKER AND A DOOR MOUNTED ICE RECEPTACLE.

3,622,215. REFRIGERATOR CABINET CONSTRUCTION.

3,622,754. GLASS PLATE SURFACE HEATING UNIT WITH EVEN TEMPERATURE DISTRIBUTION.

3,624,741. RACK SLIDING SURFACES FOR CATALYTIC COATED OVEN.

3,624,743. GAS-COOKING OVEN WITH OVEN SCAVENGING MEANS.

3,626,135. ELECTRONIC OVEN WITH FERRITE RF REJECTION FILTERS.

3,632,983. SMOOTH SURFACED, HEATED COOKTOP.

3,633,491. DRIVE MEANS FOR A ROTISSERIE SPLIT.

Applications for license under the following 41 patents may be addressed to: Patent Counsel, Electronics Laboratory, General Electric Company, Bldg. 3, Room 216, Electronics Park, Syracuse, N.Y., 13201.

3,108,158. SYNCHRONOUS DETECTION MULTIPLEX SYSTEM.

3,108,255. CODED INFORMATION TRANSMIT-RECEIVE COMMUNICATION SYSTEM.

3,117,241. TRANSMIT-RECEIVER SWITCH UTILIZING RESONANT CIRCUITS AND OPPOSITELY POLED PARALLEL DIODES FOR ISOLATION.

3,127,607. METHOD AND APPARATUS FOR RECORDING OF RADAR SIGNALS.

3,132,325. ELECTRO-OPTICAL SHIFT REGISTER.

3,144,566. TIME BASE FREQUENCY DIVIDER CIRCUIT.

3,144,638. TIME COMPRESSION STORAGE CIRCUIT.

3,149,241. TUNNEL DIODE SWITCHING CIRCUITS.

3,163,763, ELECTROLUMINESCENT-PHOTOCONDUCTOR DEVICES HAVING IMPROVED INPUT-OUTPUT ISOLATION.

3,163,775. TUNNEL DIODE LOGIC CIRCUIT.

3,177,350. TRANSISTORIZED STEP MULTIPLIER.

3,177,422. LOW LEVEL TRANSISTOR CHOPPER CIRCUIT.

3,181,002. PARAMETRIC SUBHARMONIC OSCILLATOR UTILIZING A VARIABLE SUPERCONDUCTIVE CORE INDUCTANCE.

3,189,826. METHOD AND APPARATUS FOR DEMODULATING MULTIPHASE MODULATED SIGNALS.

3,205,375. ELECTRONICALLY ADJUSTABLE NANOSECOND PULSE GENERATOR UTILIZING STORAGE DIODES HAVING SNAP-OFF CHARACTERISTICS.

3,205,376. VARIABLE WIDTH NANOSECOND PULSE GENERATOR UTILIZING STORAGE DIODES HAVING SNAP-OFF CHARACTERISTICS.

3,207,905. TOUCH-SENSITIVE OPTOELECTRONIC CIRCUITS INDICATORS.

3,211,900. ANALOG MULTIPLIER CIRCUITS USING AN ELECTROLUMINESCENT ELEMENT.

3,211,931. ELECTROMECHANICAL TRANSDUCER MOTORS.

3,227,972. APPARATUS IN WHICH PHONON ENERGY IS EFFICIENTLY GENERATED BY MAGNETOSTRICTIVE EFFECTS.

3,349,818. D.C. POWER DISTRIBUTION ARRANGEMENT FOR HIGH FREQUENCY APPLICATIONS.

3,267,394. CLOCK POWER DISTRIBUTION ARRANGEMENT FOR HIGH SPEED LOGIC SYSTEMS.

3,290,623. APPARATUS FOR THE GENERATION OF PHONONS BY PIEZOELECTRIC EFFECTS.

3,292,000. ULTRA HIGH SPEED PARAMETRIC DIGITAL CIRCUITS.

3,205,673. OPTOELECTRONIC COMPUTATIONAL DEVICES.

3,325,750. HIGH RESOLUTION TIME INTERVAL MEASURING CIRCUIT EMPLOYING A BALANCED CRYSTAL OSCILLATOR.

3,337,755. PULSE GENERATOR.

3,348,197. SELF-REPAIRING DIGITAL COMPUTER CIRCUITRY EMPLOYING ADAPTIVE TECHNIQUES.

3,371,281. FREQUENCY MODULATION RECEIVER COMBINING FREQUENCY FEEDBACK AND SYNCHRONOUS DETECTION.

3,392,236. AUTOMATIC BEAM CONTROL FOR CAMERA TUBE.

3,422,277. MAGNETIC SECOND HARMONIC ANALOG DEVICE.

3,425,263. APPARATUS FOR MEASURING SOME MECHANICAL PROPERTIES OF A MATERIAL.

3,428,828. SAMPLE AND HOLD CIRCUIT.

3,433,721. METHOD OF FABRICATING THIN FILMS.

3,439,283. FREQUENCY SHIFT KEYED DISCRIMINATING CIRCUITS.

3,439,349. CONTINUOUS THIN MAGNETIC FILM STORAGE DEVICE.

3,543,862. APPARATUS FOR MEASURING SOME MECHANICAL PROPERTIES OF A MATERIAL.

3,462,745. APPARATUS FOR TRAVERSING DIGITAL INFORMATION ACROSS BAND-PASS TRANSMISSION MEDIA.

3,465,137. ANALOG COMPUTATION FOR GENERATION OF DYNAMIC CORRECTION SIGNALS FOR CATHODE RAY TUBES.

3,479,517. SOLID STATE LIGHT EMITTING DISPLAY WITH MEMORY.

3,486,076. PRINTED CIRCUIT ASSEMBLY WITH INTERCONNECTION MODULES.

PATENT EXAMINING CORPS

R. A. WAHL, Assistant Commissioner
F. H. BRONAUGH, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF MAY 2, 1972

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	3-01-71
GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director. Heterocyclic; Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	1-04-71
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—L. J. BERCOVITZ, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	3-01-71
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. P. KENT, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	3-01-71
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—W. B. KNIGHT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	11-06-70
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Miscellaneous.	9-07-71
SECURITY, GROUP 220—R. L. CAMPBELL, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	2-11-71
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	5-04-71
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	4-15-71
PHYSICS, GROUP 280—R. L. EVANS, Director. Photography; Sound and Lighting; Indicators and Optics; Measuring and Testing; Geometrical Instruments.	2-26-71
DESIGNS, GROUP 290—R. L. CAMPBELL, Director. Industrial Arts; Household, Personal and Fine Arts.	1-18-71
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—A. BERLIN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Railways and Railway Equipment; Brakes; Rigid Flexible and Special Receptacles and Packages.	3-11-71
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders Woodworking; Tools; Cutlery; Jacks.	2-02-71
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—A. RUEGG, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	2-03-71
HEAT, POWER AND FLUID ENGINEERING, GROUP 340—M. M. NEWMAN, Director. Power Plants; Combustion Engines; Fluid Motors; Pumps; Turbines; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Vaporizing; Temperature and Humidity Regulation; Machine Elements; Power Transmission; Fluid Handling; Lubrication; Joint Packing.	4-21-71
CONSTRUCTIONS, SUPPORTS, TEXTILES, CLEANING, GROUP 350—T. J. HICKEY, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Receptacles; Supports; Cabinet Structures; Centrifugal Separations; Cleaning; Coating; Pressing; Agitating; Foods; Textiles; Apparel and Shoes; Sewing Machines; Winding and Reeling.	3-15-71

Expiration of patents: The patents within the range of numbers indicated below expire during May 1972, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,707,277 to 2,709,807, inclusive
Plant Patents..... Numbers 1,389 to 1,395, inclusive

PLANT PATENTS

GRANTED MAY 23, 1972

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,182
APPLE TREE

Clifford S. Nakamura, Misuyo Nakamura, and George Nakamura, Hood River, Oreg.; said Misuyo Nakamura assignor to said Clifford S. Nakamura and to said George Nakamura, as joint tenants

Filed Jan. 8, 1970, Ser. No. 1,572
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—35 **1 Claim**

1. A new and distinct variety of apple tree, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of a general resemblance of the fruit to that of the Mood Apple variety (unpatented), but having a much earlier coloring habit, with the coloring developing to a full red color approximately a month before maturity, and commencing to color approximately two weeks before the "Topred" variety, Plant Patent 1,916, developing stripes prominent and distinct in color by the middle of July and having good keeping quality of about 120 days in ordinary storage.

3,183
CHRYSANTHEMUM PLANT

Walter H. Jessel, Jr., Doylestown, and William E. Duffett, Akron, Ohio, assignors to Yoder Brothers, Inc., Barberton, Ohio

Filed July 27, 1970, Ser. No. 58,749
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—79 **1 Claim**

1. A new and distinct variety of pompon chrysanthemum characterized particularly as to novelty by a unique orange-bronze color, greater flower production per stem, an open terminal spray, lateral flowering down the stem, excellent breaking action on pinched crops during high temperature periods, and a uniform response at all periods, with an earlier response during high temperature periods.

3,184
CHRYSANTHEMUM PLANT

Walter H. Jessel, Jr., Doylestown, and William E. Duffett, Akron, Ohio, assignors to Yoder Brothers, Inc., Barberton, Ohio

Filed July 27, 1970, Ser. No. 58,750
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—80 **1 Claim**

1. A new and distinct variety of pompon chrysanthemum characterized particularly as to novelty by a unique pink color, greater flower production per stem, more open terminal sprays, lateral flowering down the stem, excellent breaking action on pinched crops, especially during high temperature periods, and a more uniform response to all periods, with an earlier response during high temperature periods.

3,185
CHRYSANTHEMUM PLANT

Walter H. Jessel, Jr., Doylestown, and William E. Duffett, Akron, Ohio, assignors to Yoder Brothers, Inc., Barberton, Ohio

Filed July 27, 1970, Ser. No. 58,751
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—79 **1 Claim**

1. A new and distinct variety of pompon chrysanthemum characterized particularly as to novelty by a unique golden-bronze color, a relatively larger flower, increased flowers produced per stem, with an open terminal spray, lateral flowering down the stem, a superior breaking action, especially during high temperature periods, and a uniform, early response.

3,186
BLUEGRASS PLANT

Josephus J. Barenbrug and Cornelis W. H. M. Schaepman, Arnhem, Netherlands, assignors to Barenbrug's Zaadhandel N.V., Arnhem, Netherlands

Filed Sept. 3, 1970, Ser. No. 69,507
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—88 **1 Claim**

A Kentucky bluegrass plant—Baron—having a unique red panicle and characterized by a broad leaf of dark green color, and being a dwarf variety is highly suitable for establishing sports grounds.

3,187
ILEX PLANT

John R. Bearss, Cairo, Ga., assignor to Wight Nurseries, Inc., Cairo, Ga.

Filed Sept. 9, 1970, Ser. No. 70,942
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—65 **1 Claim**

A new and distinct variety of Ilex plant which was originated as a bud mutation of *Ilex cornuta Rotunda.*

3,188
AZALEA PLANT

Henry W. Motzkau, Whitewater, Wis., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Sept. 11, 1970, Ser. No. 71,631
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—57 **1 Claim**

1. A new and distinct variety of azalea characterized particularly by its rapid growth, its unique color habit of intensifying its color during the high light periods of the year, its habit of bearing flowers in clusters, its trait of superior keeping quality under home conditions, its non-shattering, its mid-season profuse flowering, its adaptability to year round flowering programs, its evergreen type foliage, its ability to perform under sub-optimum growing conditions, and the ability of its leaves to withstand crowding and long term cold storage without turning yellow or dropping off the plant.

3,189
CHRYSANTHEMUM PLANT

Walter H. Jessel, Jr., Doylestown, and William E. Duffett, Akron, Ohio, assignors to Yoder Brothers, Inc., Barberton, Ohio

Filed Sept. 23, 1970, Ser. No. 74,941
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—74 **1 Claim**

1. A new and distinct variety of chrysanthemum characterized particularly by its unique pastel color which ranges from gloden bronze in cooler, darker weather to honey yellow in high light, high temperature periods; its superb and improved lasting qualities both as a cut flower and a pot plant; its excellent pot habit, unique in presently existing daisy types; its more uniform and faster response under low and high temperature conditions, compared to the cultivar Tuneful; and its tendency for

plants to establish themselves 4–7 days earlier than Tuneful for pinching.

3,190
CHRYSANTHEMUM PLANT
Harry B. Wilfong, Newton, N.C., assignor to Yoder Brothers, Inc., Barberton, Ohio
Filed Sept. 23, 1970, Ser. No. 74,942
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—77 **1 Claim**

1. A new and distinct variety of chrysanthemum characterized particularly as to improved traits over the parent variety, White Pink Chief, by having 4" to 6" more vigor than parent, one inch larger flowers, larger foliage, heavier caliper stems and one week later response.

3,191
CHRYSANTHEMUM PLANT
Walter H. Jessel, Jr., Doylestown, and William E. Duffett, Akron, Ohio, assignors to Yoder Brothers, Inc., Barberton, Ohio
Filed Sept. 23, 1970, Ser. No. 74,943
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—78 **1 Claim**

1. A new and distinct variety of chrysanthemum characterized particularly as to uniqueness by a strong rigid stem habit, superior uniformity of growth and response, tightly incurved form, superior form retention, uniform size and grade, resistance to high temperatures, and an intense golden yellow color.

3,192
CHRYSANTHEMUM PLANT (POLAR BEAUTY)
Leonard H. Shoesmith, Westfield-Woking, Surrey, England, assignor to Pan-American Plant Company, West Chicago, Ill.
Filed Oct. 5, 1970, Ser. No. 78,311
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—77 **1 Claim**

A new variety of chrysanthemum plant of the standard semi-incurved type producing very large white blossoms, when disbudded, and being suitable for year-around flowering with a ten week response period. The plant has a vigorous and strong upright growth habit and the blossom is durable and long lasting with a large amount of petalage which appears cream color as it opens, later turning to pure white.

3,193
ORNAMENTAL PEAR TREE
William T. Straw, 47 McCullum Road, Independence, Ky. 41051
Filed Oct. 5, 1970, Ser. No. 78,312
Int. Cl. A01h *5/03*
U.S. Cl. Plt.—36 **1 Claim**

An ornamental pear tree of the Pyrus calleryana variety is disclosed. The thornless tree is characterized by leaves which are three to four inches in length, two to three inches wide and ovate in shape. The branches of the tree are substantially horizontal from the trunk with slight upward sweeps near their tips. The annual growth color of new branches is brown with a touch of red. The leaves of the tree during the summer are medium to dark green with a very glossy top surface.

3,194
CHRYSANTHEMUM PLANT (ONWARD)
Leonard H. Shoesmith, Westfield-Woking, Surrey, England, assignor to Pan-American Plant Company, West Chicago, Ill.
Filed Oct. 5, 1970, Ser. No. 78,313
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—79 **1 Claim**

A new variety of chrysanthemum plant of standard type having large blooms of a rich bronze coloring that do not sunburn, a nine weeks year-around response to photoperiod culture, a vigorous growth habit during all seasons, and good retention of coloring under high temperature.

3,195
CHRYSANTHEMUM PLANT (ELDORADO)
Leonard H. Shoesmith, Westfield-Woking, Surrey, England, assignor to Pan-American Plant Company, West Chicago, Ill.
Filed Oct. 5, 1970, Ser. No. 78,314
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—78 **1 Claim**

A new variety of standard chrysanthemum plant having very large yellow blooms of the semi-incurved type produced on long strong stems, distinguished by its uniform response and capability of being flowered the year-around under greenhouse culture, and by its resistance to Botrytis.

3,196
POINSETTIA PLANT
Paul Ecke, Encinitas, Calif., assignor to Paul Ecke, Inc., Encinitas, Calif.
Filed Nov. 13, 1970, Ser. No. 89,537
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—86 **1 Claim**

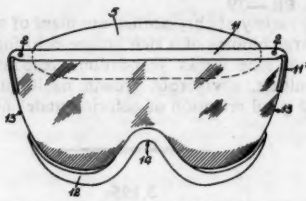
1. A new and distinct variety of poinsettia plant, substantially as herein shown and described, characterized particularly as to novelty by a unique combination of characteristics which are substantially identical in all respects to those of the poinsettia variety known as #C–1 (Plant Patent No. 2,923) except for its bract color, said bracts being a distinctive and attractive white color corresponding to near Creamy White as distinguished from the normal red color of the bracts of the variety #C–1.

PATENTS

GRANTED MAY 23, 1972

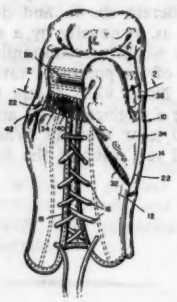
GENERAL AND MECHANICAL

3,663,959
SNOW-GOGGLES
Rene Loubeyre, 13 bis rue du Monlin-Lacroix, Saint Claude, Jura, France
Filed Oct. 31, 1969, Ser. No. 872,965
Claims priority, application France, Nov. 18, 1968, 50631
Int. Cl. A61f *9/02*
U.S. Cl. 2—14 N **4 Claims**



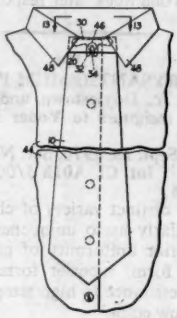
Snow-goggles comprising a visor adapted to be disposed substantially above the eyes and to project away from the forehead of a wearer, a transparent screen pending from the forward edge of said visor and adapted to pivot thereon so that the bottom portion of the screen moves away from the face of the wearer, a protective band made of soft material mounted about the lower edge and part of the sides of the screen, the said band adapted to rest on the nose of the wearer and provide interstices at both ends of the band between thc screen and the face of the wearer.

3,663,960
BOXING GLOVE
Bert Kennedy, P.O. Box 58, Caroga Lake, N.Y.
Filed Apr. 12, 1971, Ser. No. 133,231
Int. Cl. A41d *13/10*
U.S. Cl. 2—18 **6 Claims**



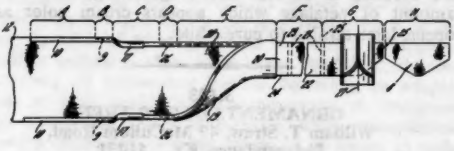
A boxing glove in which the movement of the thumb enclosing section away from the mitt section of the glove is resiliently restrained by an elastic band which connects the thumb enclosing secton directly to the outer side of the glove; the elastic band being leather covered. Another band connects the opposite side of the thumb enclosing section to the opposite side of the glove.

3,663,961
NECKTIE
John L. Piper, 250 N.E. 181st St., Portland, Oreg.
Filed June 25, 1970, Ser. No. 49,666
Int. Cl. A41d *25/08*
U.S. Cl. 2—153 **4 Claims**



The upper end portion of a single tail necktie has a perforation through which projects the bifurcated tab of a button clip secured in a rearwardly folded and stitched section of the upper portion of the tie.

3,663,962
PROCESS FOR PRODUCING PANTIES
William H. Burger, Neenah, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.
Filed Sept. 24, 1970, Ser. No. 75,193
Int. Cl. A41b *9/04*
U.S. Cl. 2—224 A **8 Claims**



A panty having a reinforced elastic waist is made from a single sheet of approximately rectangular shaped fabric material.

3,663,963
WAIST BAND ASSEMBLY
Samuel E. Miller, Winnetka, Ill., assignor to Quick Service Textiles, Inc., Chicago, Ill.
Filed Sept. 8, 1970, Ser. No. 70,270
Int. Cl. A41d *1/06*
U.S. Cl. 2—237 **7 Claims**

A waist band assembly for an article of wearing apparel, e.g. trousers, which includes a woven strip to preclude rolling over of the outer edge portion of the waist band. In order to perform its function, the strip has a degree of inherent rigidity but is flexible in the sense that its presence does not discommode the wearer or detract from the appearance of the article. These characteristics are obtained by using a comparatively stiff thread in the weft, usually monofilament

of nylon. In the present disclosure the strip so characterized is rendered longitudinally stretchable by the use of an elastic

yarn, e.g. a crimped yarn, in the warp which extends in the longitudinal direction of the strip, and the warp and weft are locked by an elastic substance.

3,663,964

METHOD OF GARMENT MANUFACTURE

Michael J. Novak, Brookfield, Ill., assignor to Hart Schaffner & Marx, Chicago, Ill.

Continuation-in-part of application Ser. No. 739,845, June 25, 1968, and a continuation-in-part of 759,528, Sept. 12, 1968. This application Nov. 16, 1970, Ser. No. 90,011

Int. Cl. A41d

U.S. Cl. 2—243 R **1 Claim**

A method of garment manufacture in which fabric material is treated with a polymeric resin, pieces of the fabric are joined together while the resin is in its uncured state, and the resin is cured by steam pressing so that any puckering or wrinkling o the fabric is removed while the material is stabilized.

3,663,965

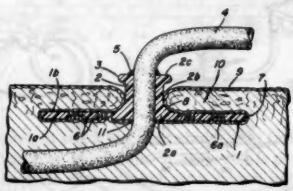
BACTERIA-RESISTANT PERCUTANEOUS CONDUIT DEVICE

Henry L. Lee, Jr., 745 Sierra Madre Blvd., San Marino, Calif.; Culp, Gordon W., 12802 Collins St., North Hollywood, Calif., and David E. Ocumpaugh, 1134-1/2 26 Street, Santa Monica, Calif.

Filed June 8, 1970, Ser. No. 44,166

Int. Cl. A61f *1/00*; A61m *25/00*

U.S. Cl. 3—1 **5 Claims**



A percutaneous device for facilitating passage of wires, tubes, and other electrical or fluid conductors through the skin of an animal, in a manner such that the wires, tubes, or other conductors are immobilized with respect to the skin and a fluid and bacterial seal is obtained. The device comprises a generally cylindrical, elongated percutaneous conduit element having a central passageway therethrough and a subcutaneous fenestrated flange disposed in generally surrounding relationship to the conduit element. The subcutaneous flange is provided with a series of holes suitably spaced and sized to facilitate growth of tissue therethrough. The conduit element and the flange are contoured to facilitate the proliferation of the external epidermis down along the outer surfaces of the conduit, out, over and under the surfaces of the subcutaneous flange, through the holes in the flange, and up the passageway in the conduit element. Thus, the epidermis provides, in effect, an exteriorization of the flange and a sphincter around the passageway to immobilize wires, tubes and other electrical or fluid conductors extending through the passageway.

3,663,966

IMPLANTABLE ARTIFICIAL HEART

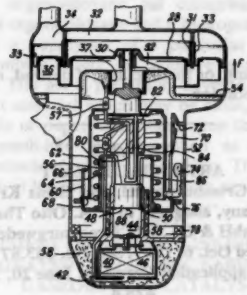
Pierre Lavigne, Grenoble, France, assignor to Commissariat a L'Energie Atomique, Paris, France

Filed Dec. 21, 1970, Ser. No. 100,255

Claims priority, application France, Dec. 31, 1969, 6945780

Int. Cl. A61f *1/24*; A61m *1/03*; F04b *45/00*

U.S. Cl. 3—1 **18 Claims**



An implantable artificial heart (without extra-corporal circulation) includes a prime mover consisting of a Rankine or Hirn steam engine and a boiler heated by a radioisotopic source. A relaxation mechanism is interposed between the piston of the engine and a hydraulic transmission device and comprises a spring enclosed between two components which are respectively connected to the driving piston and to the driving member of the hydraulic device. Abutment means limit spreading apart of said components to a value at which the compression of the spring corresponds to maintenance of the blood pressure normally prevailing at the end of the systole phase. The component which is connected to the driving piston is temporarily locked at the end of the forward stroke of the piston and unlocked upon substantially complete expansion of the spring.

3,663,967

JOINT MOVEMENT LIMITING ARRANGEMENT FOR PROSTHETIC LEGS

Clarence W. Vermillion, 4457 S.W. Stella Street, Roseburg, Oreg.

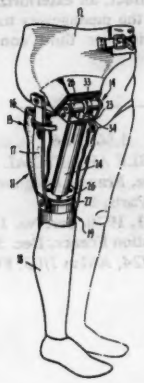
Filed Sept. 6, 1968, Ser. No. 758,031

Int. Cl. A61f *1/08*, *1/04*

U.S. Cl. 3—15 **3 Claims**

A stop arrangement for a joint of an artificial leg is described which normally limits pivotal movement of a leg portion connected to the joint to a predetermined extent commensurate with stable walking on the leg. The arrangement includes a stop in the joint which prevents over travel of the leg portion connected to the joint and buckling of the

leg under the amputee. The stop mechanism is selectively releasable to permit full pivotal movement of the joint as



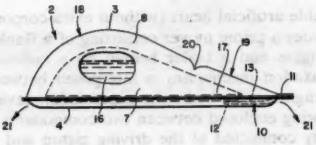
required for sitting, or the like and, if desired, may be locked in the released position.

3,663,968

ARTIFICIAL BREAST

Wilhelm Mohl, Grossburgwedel, and Heinz Kruger, Thonse, both of Germany, assignors to F. A. Otto Thamert Textil-u Kunststoff GmbH & Co., KG, Grossburgwedel, Germany

Filed Oct. 6, 1969, Ser. No. 863,877
Claims priority, application Germany, June 20, 1969, P 19 31 428.4
Int. Cl. A41c *3/10*
U.S. Cl. 3—36 **3 Claims**



An artificial breast is disclosed which is made up of two approximately similar but differently sized plastic bags, one disposed inside the other. The inner bag is filled with a liquid substance adapted to impart to its wearer the feeling of the weight of a natural breast. The outer bag is inflated by air blown into the space between the inner and the outer bag through a flap valve which is part of the outer bag. Inflating serves for adjusting the size and shape of the artificial breast to the size and shape of the remaining natural breast.

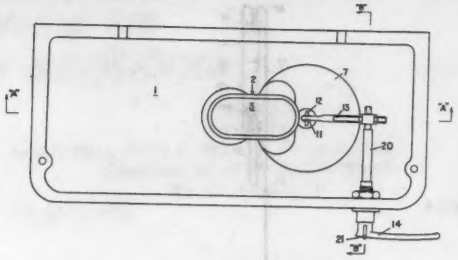
3,663,969

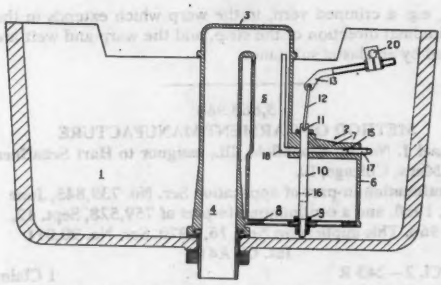
WATER CLOSET CISTERN

Thomas Edward Younger, 36 Cherry Crescent, North Kilbowie, Clydebank, Scotland

Filed Sept. 21, 1970, Ser. No. 73,861
Int. Cl. E03d *1/08*
U.S. Cl. 4—46 **4 Claims**

A siphon discharge cistern is provided in which the cistern can be discharged either partially or fully with the necessity of the operator waiting until the flushing action is completed. The partial discharge is provided by the introduction of air into the siphon unit at a predetermined level of discharge by selective actuation of an operating handle incorporating pawl mechanism said pawl mechanism when in operative position allowing a piston in the siphon unit to rise a predetermined





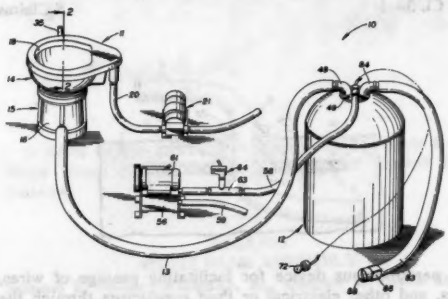
distance whereby a passage is provided for air to enter the siphon unit.

3,663,970

APPARATUS FOR PNEUMATIC TRANSPORTATION OF SANITARY WASTE FROM A TOILET TO A HOLDING TANK

Alfred J. Drouhard, Jr., Mansfield, and Joseph B. Stinson, Fremont, both of Ohio, assignors to Mansfield Sanitary, Inc., Perrysville, Ohio

Filed Mar. 30, 1970, Ser. No. 23,761
Int. Cl. A47k *11/02*
U.S. Cl. 4—111 **14 Claims**



A system for pneumatically transporting sanitary waste from a toilet to a holding tank. The holding tank communicates with the toilet through a relatively small diameter transfer conduit. The toilet has a trapless bowl portion with a valve means selectively to open and close a drain in the bowl portion. Beneath the bowl portion is a macerating portion. A vacuum pump is provided to reduce the pressure within the holding tank, transfer conduit and the macerating portion of the toilet below atmospheric. The effluent is swept through the transfer conduit to the holding tank in a series of pulsations that mark the discontinuous entrance of the

heterogeneous agglomeration into the orifice means. The tank itself includes a discriminating means to prevent the material therein from being pumped out by the vacuum pump.

3,663,971

BATHTUB

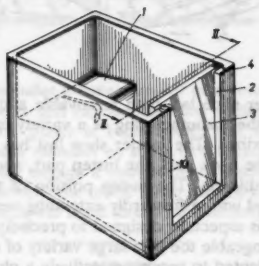
Andre Bonhote, Avenue de la Gare 4, Neuchatel, Neuchatel, Switzerland

Filed June 25, 1970, Ser. No. 49,741

Claims priority, application Switzerland, July 4, 1969, 10286/69

Int. Cl. A47k *3/00*

U.S. Cl. 4—173 **10 Claims**



This invention involves a bathtub having a door in one wall so hinged as to swing inwardly. A seal is maintained between the door and the opening in the tub wall, and this seal is reinforced by the water in the tub. A drain stopper is provided which is carried by the door and which cannot be put into drain stopping position unless the door is closed.

3,663,972

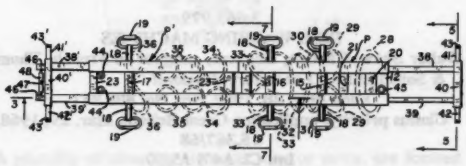
LIGHTWEIGHT STRETCHER

William E. Denton, 275 Franklin St., Loveland, Colo.

Filed Apr. 9, 1970, Ser. No. 26,970

Int. Cl. A61g *1/00*

U.S. Cl. 5—82 **11 Claims**



This lightweight stretcher has tubular side rails formed of a light metal, such as aluminum. A cross rail is provided with a laterally extensible slide at each side, which preferably carry handles, while interlocking means permit the cross rail to be moved longitudinally when the slides are in inward position, but to be locked on the side rails when the slides are pulled out laterally. In one form, the side rails are continuous and only one cross rail is provided, while in another form, the side rails are longitudinally separable, with retractable connectors extending from each portion of the side rail into the opposite portion. The side rails are connected to the ends by a head bar and a foot bar. A narrow pad, as of foam rubber, is supported by a metal strip over each side rail, while a pair of cross pieces extend between the pads, to support the head of the patient. The spacing between the cross pieces is such that, with the patient face down, the nose will extend between the cross pieces, so that the patient may breathe. The support for the pad also has cross bars which extend beneath the cross pieces of the pad and also at spaced longitudinal positions.

3,663,973

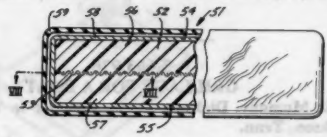
CUSHION STRUCTURE

Wayman R. Spence, Waco, Tex., assignor to Stryker Corporation, Kalamazoo, Mich.

Continuation-in-part of application Ser. No. 621,056, Mar. 6, 1967, now Patent No. 3,548,420, which is a continuation-in-part of application Ser. No. 515,525, Dec. 22, 1965, now Patent No. 3,308,491. This application Dec. 16, 1970, Ser. No. 98,816

Int. Cl. A47c *27/08*; A61f *5/04*

U.S. Cl. 5—348 **10 Claims**



A cushion structure constructed of a gel-like substance, such as an organosiloxane gel comprising the reaction product of an organosiloxane and a hydrogenosiloxane which is preferably a copolymer of a particular combination of siloxanes combined with an additive such as dimethylpolysiloxane. The gel is preferably covered, at least on one side, by sheet material which may be cloth, rubber, leather, foamed plastic or paper, depending upon the particular use. A flexible mesh-like member, such as dacron net, is preferably embedded within the cushion. The cushion structure is used to at least minimize pressure necrosis.

3,663,974

TREATMENT OF A CROSS-LINKING AGENT-IMPREGNATED CELLULOSIC FABRIC WITH A GASEOUS ACID CATALYST

Kumao Watanabe; Tooru Matumoto, and Tamio Nakagawa, all of Moriguchi, Japan, assignors to Toyo Spinning Co., Ltd., Kita-ku, Osaka, Japan

Continuation of application Ser. No. 238,294, Nov. 16, 1962, now abandoned. This application Mar. 6, 1968, Ser. No. 711,136

Claims priority, application Japan, Nov. 28, 1961, 36/43158

Int. Cl. D06m *1/16, 13/14*

U.S. Cl. 8—116.4 **8 Claims**

A fabric comprising cellulose or a blend thereof which may or may not be premercerized or prealkylated is impregnated with an aldehyde or an aldehyde liberating compound and thereafter exposed to acidic vapors to catalyze the reaction. Softening agents, bluing agents, formaldehyde catchers, optical brighteners, etc., may be included in the impregnating bath.

3,663,975

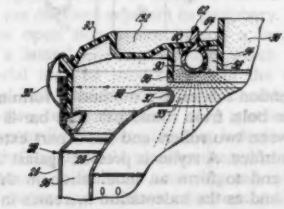
METHOD OF SUPPLYING RINSE WATER TO A PAIR OF OPEN-TOP TUBS

Austin D. Fish, Tipp City; William G. Fisher, Vandalia, and Robert F. Brubaker, Eaton, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed July 17, 1970, Ser. No. 55,813

Int. Cl. D06f *39/06*

U.S. Cl. 8—158 **2 Claims**



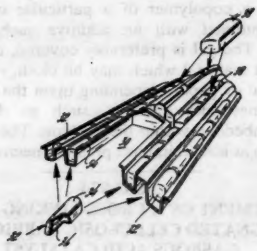
A domestic clothes washer has a pair of nested tubs one of which is imperforate to retain the washing fluid, the other of

which is perforated an rotatable to centrifuge the washing fluid from clothes being washed therein. A peripheral fill system includes a fill tube circumscribing the top of the nested pair of tubs. The fill tube has transverse rectangular slots to provide a circumferential series of fan-shaped sprays for improved wetting and immersing of the clothes at the start of a clothes washing cycle, for flushing suds from the nested pair of tubs prior to rinsing and for faster release of the tub-adhered clothes during rinse fill. The peripheral fill system includes a vacuum breaker directly connecting a domestic water supply to the fill tube for effecting pressurized sprays to the tubs without back siphoning of washing fluid.

3,663,976
GRILLAGE FOR A BOAT

Ned K. Momany, Dickson, Tenn., assignor to Winner Boats, Dickson, Tenn.

Filed Jan. 20, 1970, Ser. No. 4,284
Int. Cl. B63b *43/10*
U.S. Cl. 9—6 3 Claims

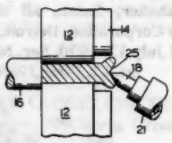


Reinforcing and flotation grillage for a boat of the fiberglass type. The grillage is configured complementary with the bilge interior, so as to define a plurality of longitudinally extended flotation compartments and includes air pressurized floats wedged into flotation compartments and laminate deck covering so that the boat is both strengthened and buoyed by grillage.

3,663,977
ROLLING ARTICLES

Jacob Marcovitch, Johannesburg, Republic of South Africa, assignor to Rotary Profile Anstalt, Vaduz, Liechtenstein

Filed July 7, 1969, Ser. No. 839,544
Claims priority, application South Africa, July 18, 1968, 68/4607
Int. Cl. B21h *3/04*
U.S. Cl. 10—26 11 Claims

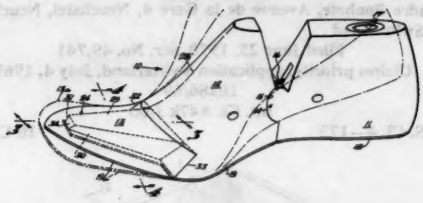


This invention relates to a method of forming headed articles such as bolts from round bar. The bar is rotated in the throat between two rollers and has a part extending beyond the roller surface. A stylus is pressed against the face of the projecting end to form an indentation in this face of the rolling bar and as the indentation increases in size a head is formed on the bar. The head can be subjected to further working if necessary.

3,663,978
MASTER SHOE LAST WITH CHANGEABLE TOE TIP PORTION

Daniel Meszaros, 113 North Market St., Martinsburg, Pa.

Filed Nov. 9, 1970, Ser. No. 88,051
Int. Cl. A43d *3/00*
U.S. Cl. 12—133 B 9 Claims

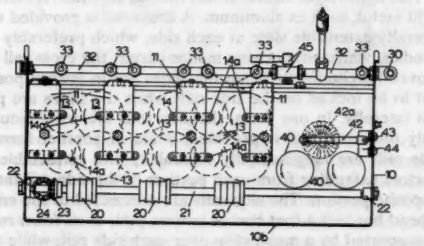


The master shoe last with removable and changeable tip portion for the manufacturing of a variety of shoes of given sizes is described. The master shoe last has three co-operative parts, the back part, the instep part, and the removable and changeable tip. The instep portion of the master shoe last is formed with a forwardly extending wedge-like projection, which is especially designed to precisely fit the removable and changeable toe of a large variety of styles. This projection is adapted to receive selectively a plurality of toe tip members of various shapes and styles to complete the master shoe last for a particular style of shoe in the size to be manufactured. The wedge is constructed to fit into a large variety of styles of toe portion and made with an interconnection that will insure substantial, rigid inter-attachment with the toe portion, thereby minimizing any possibility of shifting or misalignment of the master shoe last components during the manufacturing of the shoe. The zone of separation of the toe member from the instep part is designed in such a manner as to permit the use of composite, wood or metal materials for the making of the last. The zone of separation also is designed in such a manner that any of the usual range of heel heights can be manufactured using the same toe portion on the master shoe last, whether the last be for women's, men's or children's shoes.

3,663,979
DISH WASHING MACHINES

Walter Shaw, Chester, England, assignor to French, Thomas & Sons Limited, Lancashire, England

Filed Mar. 20, 1969, Ser. No. 808,811
Claims priority, application Great Britain, Mar. 29, 1968, 15,367/68
Int. Cl. A47l *15/00*
U.S. Cl. 15—74 6 Claims



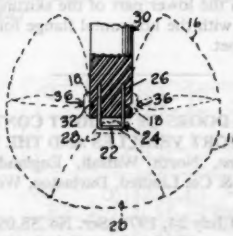
This invention consists in a dish washing machine comprising an open fronted (in use) casing, at least one set of rotary brushes mounted close together within said casing on parallel or substantially parallel axes and arranged so as to define a

washing zone or area, means for rotatably supporting an article to be washed within said washing zone, spraying means for spraying water into said washing zone, means for collecting and draining away used water, and power means for operatively rotating said brushes.

3,663,980
DOOR MAT
Roland H. Conklin, 1915 Springer Rd., Mountain View, Calif.
Filed Sept. 23, 1970, Ser. No. 74,560
Int. Cl. A47l *23/22*
U.S. Cl. 15—215 1 Claim

A door mat includes a base member of a relatively heavy gage plastic, and a soft fabric panel for wiping shoes and boots. The fabric panel is replaceable, and is releasably bonded to the base member by strips of hooked fabric. The hooked fabric may engage a complementary strip of matted fabric; or alternatively, the fabric panel may be of a tufted or matted fabric which will bond directly to the hooked fabric.

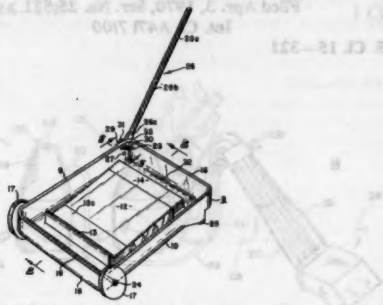
3,663,981
MOP HAVING COILED CLEANING ELEMENTS
Malquin S. Du Crest, and Stephen W. Du Crest, both of Box 95, Tensas Parish, St. Joseph, La.
Continuation-in-part of application Ser. No. 30,145, Apr. 20, 1970, now abandoned. This application Aug. 26, 1970, Ser. No. 66,995
Int. Cl. A47l *17/04*
U.S. Cl. 15—225 8 Claims



A plurality of cleaning elements, two or more, are formed of long strips of nylon net gathered lengthwise centrally of the lengths of the strips and then rolled and the gathered centers of the elements fixed, whereupon one of such elements is fixed with respect to a socket, handle or other element therebelow in such a manner as to protect a surface being cleaned from direct contact with the socket or holder. The remaining elements are secured around the lower portion of the socket or holder and blend with each other and with the lower element to appear as one fluffy cleaning unit of substantial size.

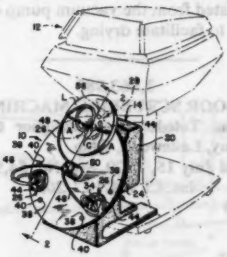
3,663,982
UTILITY CADDY FOR ROLLER PAINTING
David M. Hayden, 3646-H Falling Spring Rd., Columbia, S.C.
Filed Dec. 10, 1970, Ser. No. 96,832
Int. Cl. B05c *11/16*
U.S. Cl. 15—257 8 Claims

A utility caddy or portable carrier for paint roller pans and accessories comprising a relatively deep tray, a raised platform adapted to support and retain paint roller pans of varying sizes, large wheels supporting the forward end of the tray, a friction heel supporting the rear end of the tray, and an adjustable handle for pushing the caddy from place to place.



Drip troughs surrounding the raised platform catch paint spilled while filling the roller pan or wetting the roller and are also adapted to carry and store the paint roller and miscellaneous painting tools.

3,663,983
LENS BLOCKING APPARATUS
Hamilton B. Bole, Sturbridge, Mass., assignor to American Optical Corporation, Southbridge, Mass.
Filed June 5, 1970, Ser. No. 43,684
Int. Cl. B24b *19/00*
U.S. Cl. 51—277 5 Claims



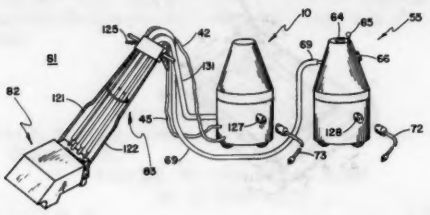
Apparatus for molding a lens block directly upon one side of a lens blank for use in conjunction with other apparatus for performing manufacturing operations upon the blank. The blocking apparatus comprises, in general, an axially rotatable disc upon one side of which a number of block-forming molds are disposed adjacent its periphery. The molds each have one open side against which a lens blank is clamped and a lateral opening through which a suitable blocking material may be introduced into the mold at a blocking station. The blocking station is reached by rotatably indexing the disc until alignment of a particular mold therewith is accomplished. Lens aligning indecia associated with each block-forming mold are illuminated at the block-forming station so as to facilitate centering and cylinder axis alignment of a particular lens blank relative to a block to be formed thereon at the molding station.

3,663,984

PORTABLE VACUUM CARPET AND UPHOLSTERY CLEANING APPARATUS

Peter C. Anthony, Waltham; James G. Colt, Belmont, and Solon Fournarakis, Waltham, all of Mass., assignors to Carpetech Corp., Everett, Mass.

Filed Apr. 3, 1970, Ser. No. 25,521
Int. Cl. A47l 7/00
U.S. Cl. 15—321 6 Claims



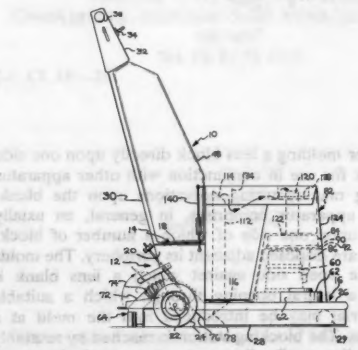
Apparatus for cleaning carpets, upholstery and the like comprising a separate reservoir system for supplying under pressure to a remote cleaning head a heated cleaning solution and a separate vacuum pick-up system for picking up via the cleaning head and storing cleaning solution applied to a carpet or the like. The reservoir system includes means to continuously heat the cleaning solution in the reservoir and a fluid pump and an air pump driven by an electric motor. The vacuum system includes a vacuum pump which is driven by a second electric motor on an electrical circuit separate and distinct from that of the motor in the reservoir system. Both motors are of a size and design that they may be separately started up and operated at full load on separate residential electrical circuits without blowing the fuses for these circuits. The vacuum system may also include means for directing the heated air exhausted from the vacuum pump onto the material being cleaned to facilitate drying.

3,663,985

FLOOR SCRUBBING MACHINE

Jack L. Burgoon, Toledo, Ohio, assignor to The Scott & Fetzer Company, Lakewood, Ohio

Filed July 15, 1970, Ser. No. 54,991
Int. Cl. A47l 11/202
U.S. Cl. 15—353 15 Claims



A compact floor scrubbing machine is provided. The floor scrubbing machine is relatively small, with a short length rendering the machine more easily manipulated or maneuverable than floor scrubbing machines heretofore known. A cleaning solution supply tank is mounted on a rear portion of the machine and motors are located forwardly thereof for driving the brushes of the machine and an exhaust blower. A removable recovery tank is located adjacent the two motors and partly thereabove, between the supply tank and the motors, so that maximum compactness is achieved for the machine. The recovery tank is easily separable from the rest of the machine and yet automatically seals with air passages for the exhaust blower and for a rear squeegee when placed on the machine.

3,663,986

CARPET EDGE MOLDING

Bernard M. Harby, West Vancouver, Canada, assignor to Bernard Harby Limited, Vancouver, British Columbia, Canada

Filed Sept. 26, 1969, Ser. No. 861,401
Claims priority, application Canada, Aug. 11, 1969, 059183
Int. Cl. A47g 27/04
U.S. Cl. 16—7 4 Claims

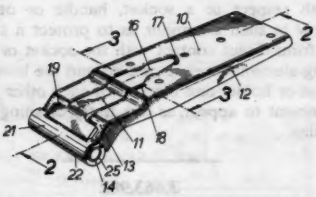
A carpet edge molding including a vertical flange forming a decorative skirting member, a horizontal flange part of which is adapted to be nailed underneath a carpet fastening strip and held thereby, and a flexible flap extending downwardly from the lower part of the skirting member and forming a recess with the horizontal flange for receiving the cut edge of a carpet.

3,663,987

HINGE FOR DOORS OF FREIGHT CONTAINERS, TRANSPORT VEHICLES AND THE LIKE

John C. Hawkins, North Walsall, England, assignor to Rubery, Owen & Co. Limited, Darlaston, Wednesbury, England

Filed July 24, 1970, Ser. No. 58,091
Claims priority, application Great Britain, July 26, 1969, 37,648/69
Int. Cl. B60b 33/00
U.S. Cl. 16—128 5 Claims

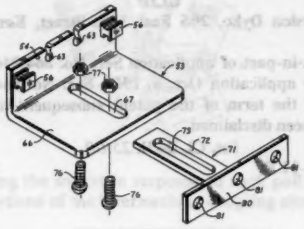


A hinge member of a hinge for the door of a freight container or transport vehicle is formed by a sheet metal pressing incorporating an eye for a hinge-pin and stiffened by a deep closed recess extending longitudinally from the eye.

3,663,988
DRAPERY MASTER CARRIER

Arthur M. Malles, 4909 Engle Road, Carmichael, Calif.

Filed Oct. 23, 1970, Ser. No. 83,409
Int. Cl. A47h *13/00*
U.S. Cl. 16—87.2 2 Claims

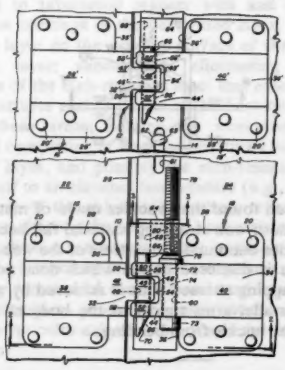


A drapery cord actuated slide member is translatably mounted on a drapery rod and carries a vertical plate having its outer surface covered with an adhesive or other bonding agent, such as "Velcro," to engage and support the leading upper corner portion of a drape. By attaching the leading upper corner portion of the drape to the plate, the corner of the drape is provided with firm backing over a substantial area and drooping is obviated. Optionally, the slide member can be made bilaterally symmetrical and connected to the drape supporting plate by an adapter which enables the device to operate either as a right-hand or a left-hand master carrier.

3,663,989
LATCH AND HINGE DEVICE

James S. Ellard, Jr., Rockville, Md., assignor to The United States of America as represented by the Secretary of the Navy

Filed Oct. 5, 1970, Ser. No. 77,960
Int. Cl. E05d *15/50, 7/10;* E05c *1/06*
U.S. Cl. 16—147 1 Claim



A latch device which may simultaneously act as a hinge having a master latch and at least one slave latch. Each latch includes a pair of cooperating members attached to separate wall members which, when engaged, present a series of bores in an axially aligned configuration. By turning a threaded member housed in the master latch an actuator bar may be moved thereby causing a series of tapered pins fixedly connected to the actuator bar to move into the axially aligned bores. The contour of the cooperating latch members enable the latches to act as hinges; i.e., to pivot about the tapered pins.

3,663,990
HINGE

Berwyn E. Shane, Oakland, Calif., assignor to Pacific Associated Lighting, Inc., San Francisco, Calif.

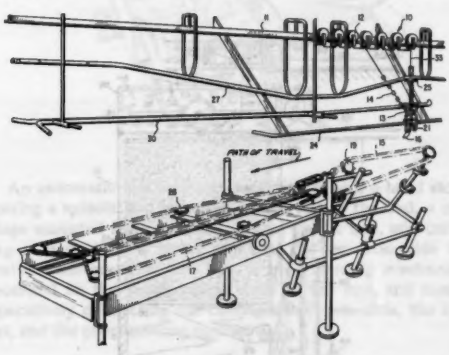
Filed Dec. 11, 1969, Ser. No. 884,203
Int. Cl. E05d *1/04*
U.S. Cl. 16—178 1 Claim

A lighting fixture enclosing lamps in a wall-mounted container having a hinge that permits free removal of the cover in a limited range of open positions and permits the cover to be locked in a fully open position for access to the lamps contained therein, the hinge being of the type without a pintle and formed with a first member having a receiving flute with a constricted opening and a second member having a flared edge insertable into the receiving flute allowing limited relative swing movement between the two members.

3,663,991
METHOD AND APPARATUS FOR EVISCERATING CHICKENS OR OTHER FOWL

Grover S. Harben, Jr., Gainesville, Ga., assignor to Gainesville Machine Company, Inc., Gainesville, Ga.

Filed May 8, 1970, Ser. No. 35,672
Int. Cl. A22c *21/06*
U.S. Cl. 17—11 12 Claims



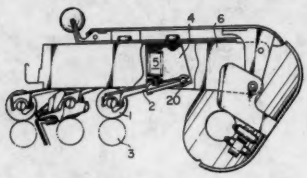
An evisceration system for removing the viscera from chickens or other fowl being conveyed in a head lowermost suspended state along a predetermined path. A special shackle for suspending the bird by its hocks is provided with a sterilized spoon-shaped viscera removal tool cooperative with structural guides positioned along the predetermined path of travel for being automatically extended into a precut hole in the abdomen of the bird and withdrawn therefrom. Devices are provided in the path of travel for maintaining a proper orientation of the bird to permit removal of all of the viscera by the spoon-like member.

3,663,992

LOADING MECHANISM APPLIED TO THE DRAFTING MECHANISM OF A SPINNING MACHINE

Nobugi Ooki, Fujisawa-shi, and Kenzi Okubo, Tokyo, both of Japan, assignors to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 13, 1970, Ser. No. 2,462
Claims priority, application Japan, June 30, 1969, 44/61020; 44/61021
Int. Cl. D01h 5/50
U.S. Cl. 19—281 8 Claims



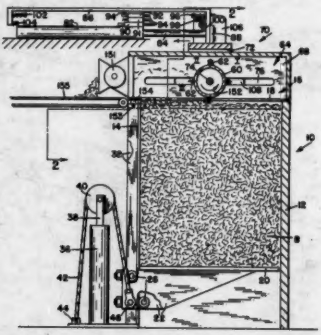
An improved loading mechanism applied to a third, fourth or back top roller of the pendulum arm type drafting mechanism. The loading mechanism of the invention is provided with means for compensating the unparallelism of the top roller to the cooperating bottom roller. This compensation means utilizes an abutment for receiving a bottom end of a helical spring which imparts a pressure to the top roller for urging the cooperating bottom roller and the abutment is turnably mounted on a guide arm of the pendulum arm mechanism in an eccentric condition with respect to the longitudinal axis of said helical spring.

3,663,993

APPARATUS FOR PLUCKING A DENSE MASS OF FIBERS

James H. Roberson, Greenville, S.C., assignor to Crompton & Knowles Corporation, Worcester, Mass.

Continuation of application Ser. No. 865,845, Oct. 3, 1969, now abandoned. This application Feb. 22, 1971, Ser. No. 117,785
Int. Cl. D01g 7/06
U.S. Cl. 19—80 R 13 Claims



A fiber bale plucker in which the bale is maintained in plucking engagement with a plucking cylinder by a hydraulically operated lifting platform while the plucking cylinder, containing plucking pins traverses along the contacting surface of the bale in a plucking stroke. The plucking cylinder is operated from an air cylinder which can reverse the direction of the plucking cylinder for a return stroke. There are valves which are operated at the end of each stroke to change the operating direction of the air cylinder and to operate a hydraulic cylinder to move the bale away from the plucking cylinder at the end of a plucking stroke and to move the bale toward the plucking cylinder at the end of the return stroke of the plucking cylinder. Aerodynamic flow means are used to doff fibers from the plucking pins and to convey the fibers to their destination.

3,663,994

CLIP

Herbert Gordon Dyke, 206 East 35th Street, Kent County, Del.

Continuation-in-part of application Ser. No. 864,944, Dec. 15, 1967. This application Oct. 6, 1969, Ser. No. 864,110. The portion of the term of the patent subsequent to Nov. 23, 1988, has been disclaimed.
Int. Cl. B43k 25/00
U.S. Cl. 24—11 P 15 Claims

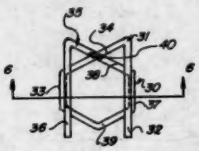
Clip, for pen or any of various articles to be detachably attached to the clothing or the like, which has a stiff support spring-hingedly carrying a gripping arm, with an opening through the support near the head end thereof through which projects a member which, when squeezed down toward the pen body, forces the gripping arm to move out from the pen body and thereby open up the clip.

3,663,995

SELF-LOCKING STRAP BUCKLE

Gert Somann, Huron Park, Ontario, Canada, assignor to Ferplas Industries Limited, Huron Park, Ontario, Canada

Filed Apr. 2, 1970, Ser. No. 25,083
Claims priority, application Canada, Apr. 2, 1969, 047577
Int. Cl. A44b 11/00
U.S. Cl. 24—74 4 Claims



It has been found that buckles made of metal for us with plastic or cloth web strapping material fail because the arms of the buckles bend under the stress of the web.

A buckle is disclosed herein which does not bend under normal strapping stresses. This is achieved by welding one of the four parallel arms rigidly to the body of the buckle to constrain the buckle from bending.

3,663,996

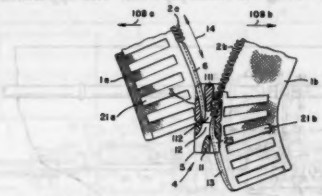
TAPE-SUPPORTED SEPARABLE SLIDE FASTENER

Helmut Heimberger, Grenzach, and Alfons Frohlich, Essen, both of Germany, assignors to Optic-Holding AG

Filed Jan. 27, 1970, Ser. No. 6,120
Claims priority, application Germany, June 6, 1969, P 19 28 691.0
Int. Cl. A44b 19/38, 19/12
U.S. Cl. 24—205.11 12 Claims

In a separable tape-supported slide fastener comprising a pin-and-socket connection at one end, accidental separation of the two halves by a transverse pull exerted below the

socket connection is prevented by a slidable mounting of the pin socket which is provided with internal camming formations shifting the socket in response to such pull to interlock the end portions of the intermeshing coupling elements.

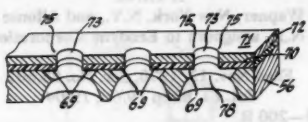


3,663,997

METHOD FOR MAKING A KINESCOPE COMPRISING PRODUCTION AND TREATMENT OF A TEMPORARY MASK

Philip Kuznetzoff, Somerville, N.J., assignor to RCA Corporation

Filed Sept. 30, 1970, Ser. No. 76,779
Int. Cl. H01j 9/00
U.S. Cl. 29—25.14 10 Claims



Method for producing a color kinescope by steps comprising the provision of a perforated etch-resistant layer on a substrate and providing apertures in the substrate, which apertures are in substantial register with and individually larger than the openings of the perforated layer; providing a heat-resistant layer on the exposed surface of the perforated etch-resistant layer; substantially eliminating the bond between areas of the etch-resistant layer that extend partially across the apertures and the parts of the heat-resistant layer located on these areas; heating the workpiece thus far produced and comprising at least the apertured substrate and heat-resistant layer, and possibly the etch-resistant layer or portions thereof to an elevated temperature (e.g., the annealing temperature of the substrate) to stress relieve the substrate and then shaping the substrate-heat-resistant layer assembly to produce a temporary mask; producing an image screen with the temporary mask; removing the heat-resistant layer and any remains of the etch-resistant layer from the apertured substrate to produce a color-selection mask; and incorporating the color-selection mask and the image screen in a kinescope.

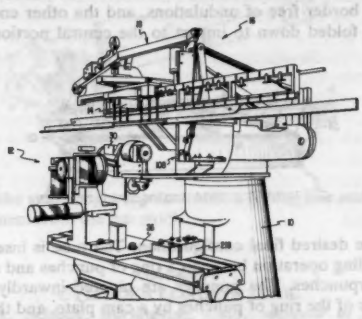
3,663,998

APPARATUS FOR CONDUCTING MACHINING OPERATIONS

John A. Cupler, II, 10 Cupler Dr., LaVale, Cumberland, Md.

Continuation-in-part of application Ser. No. 715,711, Mar. 25, 1968, now Patent No. 3,478,419. This application Oct. 22, 1969, Ser. No. 868,517
Int. Cl. B23q 3/157
U.S. Cl. 29—26 A 14 Claims

The disclosure is directed to a vertically oriented automatic tool changer employing non-captive tools for performing machining and/or assembly operations at a plurality of work locations on a single workpiece which workpiece is supported by a work positioner capable of infinite adjustment to present any desired number an spacing of work locations, on the workpiece, to the working axis of the non-captive tools.

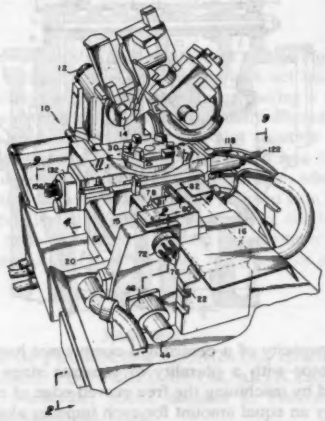


3,663,999

AUTOMATIC MACHINE TOOL CONTROL MECHANISM

Francis D. Catlin, Horseheads, N.Y., assignor to Hardinge Brothers, Inc., Elmira, N.Y.

Filed Jan. 23, 1970, Ser. No. 5,292
Int. Cl. B23b 21/00
U.S. Cl. 29—44 21 Claims



An automatic machine tool including a bed, a head stock having a spindle and mounted at one end of the bed, a carriage mounted for longitudinal travel on the bed, and carrying a cross-slide, a turret mounted on the cross-slide for travel transversely of the bed, a programming mechanism mounted on the positioned laterally of the bed, and means operatively connecting the carriage, the cross-slide, the turret, and the programming mechanism.

3,664,000

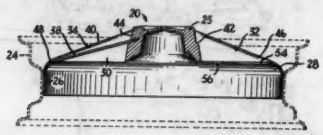
METHOD OF MAKING WHEELS FOR AUTOMOTIVE VEHICLES

Daniel Le Jeune, Clermont-Ferrand, France, assignor to Compagnie Generale Des Etablissements Michelin raison sociale Michelin & Cie, Clermont-Ferrand (Puy-de-Dome), France

Original application Dec. 11, 1967, Ser. No. 689,668, now abandoned. Divided and this application Nov. 19, 1969, Ser. No. 871,324
Int. Cl. B21h 1/02; B21k 1/32
U.S. Cl. 29—159.01 1 Claim

A wheel disk has a circumferential profile formed with crenellations. The depth of the crenellations is maximum ad-

jacent to the hub and ranges from the maximum down to zero adjacent to the rim. In making a wheel disk, a generally cylindrical tube is formed, the tube is widened at one end to form a border free of undulations, and the other end of the tube is folded down to impart to the central portion of the



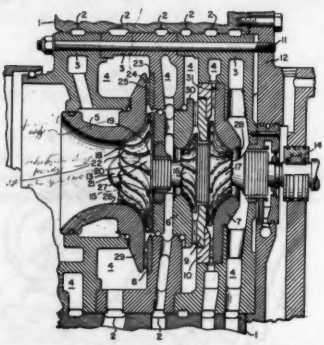
disk the desired final configuration. The tube is inserted for the folding operation between a ring of punches and a ring of counterpunches. The punches are pivoted inwardly toward the axis of the ring of punches by a cam plate, and the pivoting of the counterpunches is limited by a second plate.

3,664,001

METHOD OF CHANGING CAPACITY OF FLUID REACTION DEVICE

Karol Pilarczyk, Loudonville, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed June 8, 1970, Ser. No. 44,263
Int. Cl. B23p *15/00*
U.S. Cl. 29—156.4 R **6 Claims**



The capacity of a centrifugal compressor having an overhung rotor with a plurality of separate stage impellers is changed by machining the free curved edge of each impeller blade by an equal amount for each impeller along the entire curved edge length from the radially extending axial flow edge to the axially extending radial flow edge. Additional separate shrouds are provided that differ in diameter from the shrouds supplied with the impellers before machining by an amount equal to the diametric change occurring during machining. Further, separate annular diffusers are provided, with each diffuser having integral blades with free terminal edges lying in a common plane perpendicular to the axis of rotation and engaging the adjacent shroud, so that these radially extending diffuser blade edges may be machined by an amount equal to the axial component of machining on the corresponding impeller blades.

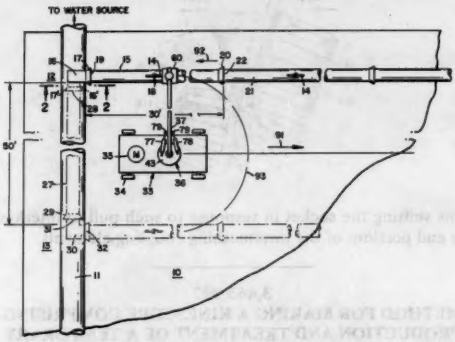
3,664,002

IRRIGATION PIPE TRANSFER APPARATUS

Reuben H. Morine, 250 Baldwin Ave., Apt. 812, San Mateo, Calif.

Filed June 30, 1971, Ser. No. 158,205
Int. Cl. B23p *19/00*
U.S. Cl. 29—200 D **11 Claims**

Apparatus is disclosed comprising a mobile platform having a universally mounted extensible boom thereon for selectively grasping a pipe section branching off of a main irrigation pipeline, moving it out of locking engagement with a pipe connection thereon, then transferring the pipe section to a remote location along the main pipeline. The apparatus in-



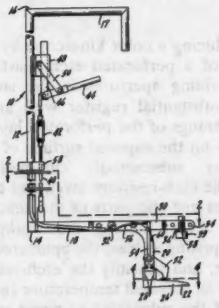
cludes means for maintaining the orientation of the transferred pipe section so that the same end which is unlocked from the pipe connection is presented at the remote location for connection and the pipe section is in proper position for operation.

3,664,003

APPARATUS FOR INSERTING FILTER ELEMENTS INTO A TANK

Stanley H. Wapner, New York, N.Y., and Alfonse J. Soriente, Gillette, N.J., assignors to Ecodyne Corporation, Chicago, Ill.

Filed Nov. 12, 1970, Ser. No. 88,602
Int. Cl. B23p *19/00*, *19/04*
U.S. Cl. 29—200 R **8 Claims**



An improved apparatus for inserting filter elements into a tank designed for use with a particular type of filter element. The apparatus has an elongated rod portion having first and second ends and element support means outwardly disposed from the first end. Element spring compressing means are positioned above the support means and mounted for movement in a direction generally parallel to the rod portion. Control means are provided adjacent to the second end of the rod portion for controlling the movement of the spring compressing means.

3,664,004

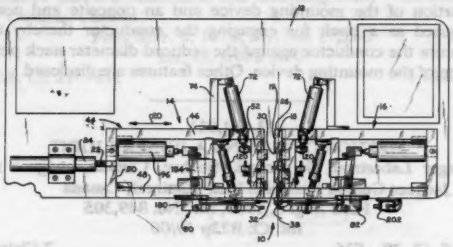
BOBBIN LUGGER

William C. Thoms, East Berlin, Pa., assignor to Berg Electronics, Inc., New Cumberland, Pa.

Filed Jan. 18, 1971, Ser. No. 107,268
Int. Cl. H01r *43/04*
U.S. Cl. 29—203 D **12 Claims**

A bobbin lugger having two like lugging assemblies with a feed bar sandwiched between the assemblies. Lugs are fed

along the joints between the bar and each of the assemblies toward one end of the bar where the lead lugs are inserted into a bobbin held on the end of the bar and are bent away



from the bobbin to secure them to the bobbin. One lugging assembly is moveable away from the other lugging assembly so that either joint may be opened depending upon which assembly the feed bar is secured to.

3,664,005

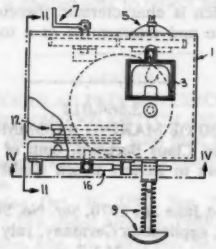
DEVICE FOR FASTENING A HOOK TO A FISHING LINE

Ciatti Enzo, Via Starnina 48, Florence, Italy

Filed Mar. 13, 1970, Ser. No. 19,448

Int. Cl. B23q 7/10

U.S. Cl. 29—211 D **5 Claims**



A turning device having an external appendix for seizing a fishing line is coaxially mounted to surround a hook stem which is supported on a feed supporting member inside a tube. Retractable pliers are mounted adjacent the turning device. The hook stem is placed in a binding position, the line is retained by gripping members, the pliers are extended in their support in an open position to receive the fishing line, and means are provided for rotating the turning device to wind the fishing line around the hook stem whereby the retraction of the pliers to close its jaw members firmly attaches the line to the hook stem. A cutting mechanism then severs the line.

3,664,006

TOOL FOR ATTACHING SINKERS TO A FISHING LINE

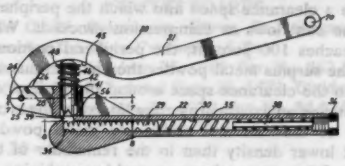
Thomas Valle, Carbondale, Colo., assignor to Ralph R. Crandell and Albert G. W. Hack, Denver, Colo., part interest to each

Filed June 29, 1970, Ser. No. 50,681

Int. Cl. B23q 7/10

U.S. Cl. 29—212 D **2 Claims**

The sinker attaching tool disclosed includes a pair of handles pivoted together with a clamping head on one end of one of the handles. The other handle includes a magazine bore for receiving a strip of sinker weight stock. The stock includes a plurality of integrally joined split weight segments. One of the segments is placed beneath the clamping head and a fishing line placed in the split. Operation of the tool



clamps the split weight segment onto a fishing line and severs the segment from the bar stock.

3,664,007

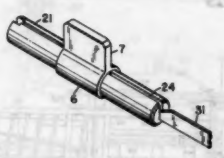
CYLINDER LOADING TOOL

Ernest L. Schlage, Burlingame, Calif., assignor to Schlage Lock Company

Filed Oct. 5, 1970, Ser. No. 78,026

Int. Cl. B25b 27/14

U.S. Cl. 29—271 **7 Claims**



A cylinder loading tool for loading pins and springs into a pin tumbler cylinder for a pin tumbler lock set includes a rod, longer than the pin tumbler cylinder, having a slot extending therein from end to end with axially aligned, radial pin bores in the rod intersecting the slot together with a cylindrical sleeve adapted to fit over the rod and together with a slide of generally rectangular configuration adapted to fit readily within the slot and having an inclined cam surface along one side adapted to abut a pin and spring combination in one of the radial bores in the rod and to press such pin and spring combination outwardly against the sleeve or into the cylinder.

3,664,008

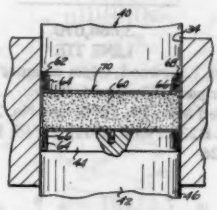
METHOD OF PRODUCING ELONGATED HIGHLY DENSIFIED POWDERED METAL ARTICLES

John Haller, Northville, Mich., assignor to Federal-Mogul Corporation, Southfield, Mich.

Filed June 12, 1969, Ser. No. 832,576

Int. Cl. B22f

U.S. Cl. 29—420 **10 Claims**



An elongated air-tight can with rounded top, bottom and ends and a filling stem is prepared from heat-resistant material, filled with the powdered metal to be compacted, exhausted to a high vacuum, and the stem sealed while maintaining the vacuum. The powder-filled evacuated can is then heated to a high temperature of approximately 2,100° F. for

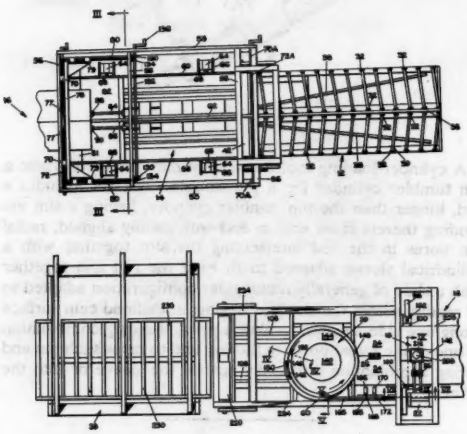
about 1 hour, then compressed in the die cavity of a press having a recess in one of its plungers for the stem, and with at least one of its plungers having an end of reduced diameter to provide a clearance space into which the peripheral portion of the can flows as compression proceeds. When the density reaches 100 percent, the peripheral portion of the can and the surplus metal powder therein continue to move axially into the clearance space around the plunger or plungers, producing an axially projecting lip extending around the periphery of the can and containing metal powder at a somewhat lower density than in the remainder of the can. The walls of the can are then removed by machining or pickling, together with the less dense peripheral portion of the now substantially solidified elongated metal billet thus produced.

3,664,009

MANUFACTURE OF BIFOLD DOORS

William R. Fritze, Hillsdale, and Wallace W. Scarlett, Kentwood, both of Mich., assignors to Plymouth Flush Door, Inc., Hillsdale, Mich.

Filed July 1, 1970, Ser. No. 51,512
Int. Cl. B23p *19/00*; B23q *7/10*; B23p *11/00*
U.S. Cl. 29—429 **28 Claims**



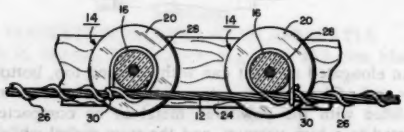
Hinging of door halves by pressing hinges having fastening projections depending therefrom onto a pair of door halves. Hinge blanks are oriented and stamped to form the depending fastening projections and, thus stamped and oriented, are fed to the pressing zone for application to the doors. The door halves are fed in side-by-side relationship through the hinge pressing zone.

3,664,010

LINE TIE

John R. D'Agati, Lakewood, Ohio, assignor to Preformed Line Products Company, Cleveland, Ohio

Filed Mar. 19, 1970, Ser. No. 21,068
Int. Cl. B23p *19/00*; H01g *17/16*; F16g *11/00*
U.S. Cl. 29—526 **3 Claims**



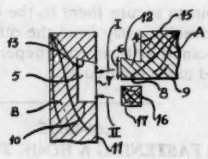
An appliance for fastening an electrical conductor, etc. to a mounting device is disclosed. The appliance has an elongated leg portion helically preformed to a predetermined internal diameter and pitch length for application to the linear body in gripping relation therewith. A return bent portion of the appliance has one end integral with the leg portion, an intermediate segment for encircling a reduced diameter neck portion of the mounting device and an opposite end configured as a hook for engaging the conductor thereby to secure the conductor against the reduced diameter neck portion of the mounting device. Other features are disclosed.

3,664,011

METHOD OF MAKING A JOINERY JOINT

Roger Labastrou, Ile Bizard, Quebec, Canada, assignor to Jacques Guillon Designers Inc., Montreal, Canada

Filed Aug. 8, 1969, Ser. No. 849,305
Int. Cl. B23p *19/00*
U.S. Cl. 29—526 **7 Claims**



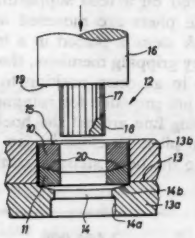
This invention relates to a method and means for making a continuous joint between panel members, the new joint being a modified form of a dovetail joint an preserving the rigidity of assembly which is characteristic thereto, while being as easy to assemble and disassemble as a tongue and groove joint.

3,664,012

METHOD OF MAKING A COMMUTATOR

Heinz Wilke, and Claus Bertram, both of Hildesheim, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed June 26, 1970, Ser. No. 50,095
Claims priority, application Germany, July 5, 1969, P 19 34 213.3
Int. Cl. H01r *43/00*
U.S. Cl. 29—597 **7 Claims**



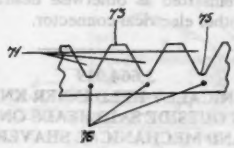
A pair of annular blanks, one consisting of copper and one consisting of another metal, are confined in a die. A stamp is introduced into the die and the material of the blanks is cold-extruded through an annular gap defined between the stamp and the die, to form a commutator ring an inner annular zone of which consists of the other metal, whereas an outer annular zone consists at least at one axial endface of copper. The other metal may be aluminum and will be cold-welded or fused with the copper at the interface of the two metals.

3,664,013

METHOD OF MANUFACTURING ELECTRIC HEATING PANELS

Andrew Edward MacGuire, 143 Goulding Ave., Willowdale, Ontario, Canada

Filed Mar. 6, 1970, Ser. No. 17,168
Int. Cl. H06b 3/00
U.S. Cl. 29—611 2 Claims



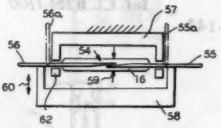
An electric heating panel is composed of two cakes compressed into a homogeneous unitary body of a thermosetting polymerizable resin having an inert filler with an intermediate asbestos sheet having an electric heating circuit lying wholly against one surface of said sheet, the method of manufacturing said panel consisting of impaling the sheet upon a set of spaced upstanding prongs around which the wire of said circuit is next bent, temporarily securing said wire in the pattern so formed, disimpaling said sheet and circuit, and uniting said cakes with said sheet and circuit therebetween under heat and pressure, the said cakes having a moisture content of between 8 and 12 percent by weight after drying, the panel being aluminum or gold painted on one surface if it is desired only to reflect heat from the other surface.

3,664,014

UNIVERSAL MODULAR PRINTED CIRCUIT MAGNETIC REED KEYBOARD SWITCH ASSEMBLY

Peter A. Peroni, Pottstown, and John Paul Jones, Jr., Wayne, both of Pa., assignors to Navigation Computer Corporation, Norristown, Pa.

Original application Oct. 26, 1967, Ser. No. 678,336, now Patent No. 3,462,719, dated Aug. 19, 1969. Divided and this application Aug. 14, 1969, Ser. No. 850,100
Int. Cl. H01h 11/00
U.S. Cl. 29—622 2 Claims



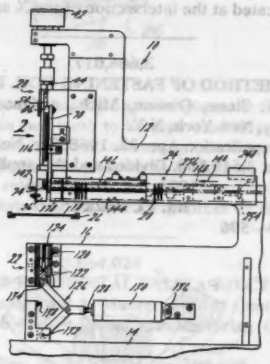
At least one glass tube enclosed magnetic reed switch is mounted on a planar printed circuit board which is removably inserted into a hollow housing member in grooves on either side of an axially movable planar key member with a magnet thereon actuating the switch contacts during a limited range of movement. This provides a universal mounting arrangement wherein one to four switches and other circuit elements may be located upon the printed circuit cards for operation by a single manually depressed key at one or more positions of its stroke. Each switch is standardized for predetermined operation timing during the magnet movement by selectively bending the leads and inserting into registration apertures in the printed circuit boards. The switch is thus precisely located within the magnetic field by simplified structure affording strain relief at closed ends of the glass tubes. The leads are bent normal to the reed switch axis for this purpose at calibrated positions to thereby precisely locate the magnetic switch gaps by means of punched hole pairs easily located to close tolerances in the printed circuit board.

3,664,015

METHOD FOR MOUNTING WIRE WRAP PINS ON CIRCUIT BOARDS

Johannes C. W. Bakermans, Etters, Pa., assignor to Berg Electronics, Inc., New Cumberland, Pa.

Original application Aug. 25, 1969, Ser. No. 862,591, now Patent No. 3,605,237, dated Sept. 20, 1971. Divided and this application Oct. 28, 1970, Ser. No. 84,925
Int. Cl. H05k 13/04, 3/00
U.S. Cl. 29—625 3 Claims



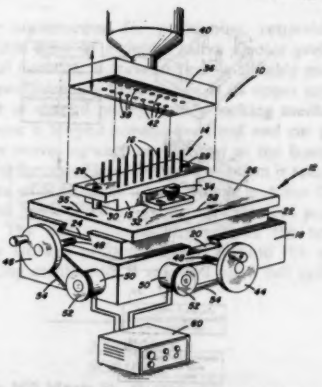
Apparatus for mounting a pin on a circuit board in which the pin is fed to a position in approximate alignment with a punch, following which the pin is aligned accurately with the punch by a pair of clamps and the punch is moved toward the pin to pick up the pin. The clamps open and further movement of the punch secures the pin to the circuit board.

3,664,016

APPARATUS AND METHOD FOR ALIGNING A PLURALITY OF CONNECTOR MOUNTED PINS BY DEFORMATION AND REFORMATION THEREOF

John M. Sevc, Trumbull, and Howard E. Pierce, Jr., Watertown, both of Conn., assignors to Litton Systems, Inc., Beverly Hills, Calif.

Filed Mar. 24, 1970, Ser. No. 22,344
Int. Cl. B23q 17/00; H01r 43/00
U.S. Cl. 29—407 10 Claims



An alignment apparatus and method for aligning a plurality of connector mounted pins is shown having a work table for mounting a connector thereon which is capable of linear displacements in four directions along X and Y axes. A fixture engages the ends of the connector mounted pins for retaining these pins in the desired aligned position while the connector is displaced with respect to that position. The mounting

frame is displaced in one direction along the X-axis beyond the elastic limit of the pins for permanently deforming them and then displaced in a second direction beyond the elastic limit for again deforming the pins. The mounting frame is finally displaced in the first direction passed the center position a distance sufficient to remove the deformation caused by the last displacement and then returned to the center position for aligning the pins with respect to the center position along the X-axis. These same steps are repeated along the Y-axis for aligning the plurality of pins with the desired center position along that axis, thus aligning the pins with the center position located at the intersection of the X and Y axes.

3,664,017

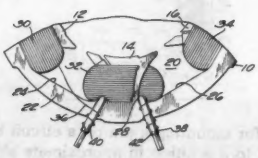
METHOD OF FASTENING COIL LEADS

Thomas W. Stone, Owosso, Mich., assignor to The Singer Company, New York, N.Y.

Original application Apr. 22, 1968, Ser. No. 723,152, now Patent No. 3,519,860. Divided and this application Feb. 27, 1970, Ser. No. 18,396

Int. Cl. H02k *15/00*

U.S. Cl. 29—596 **6 Claims**



Coil leads are positioned in the corners of the coil slots formed at the juncture of the inner coil slot walls and the poles. The coils are wound in place on the poles over the lead wires securely anchoring the lead wires in the corners. The coil ends are connected to the lead wires.

3,664,018

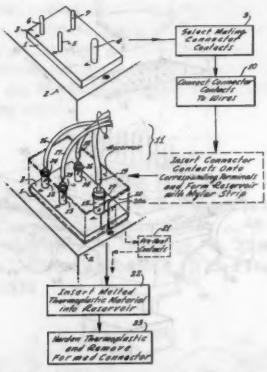
METHOD OF MANUFACTURING A MATING ELECTRICAL CONNECTOR

John Peter McGregor, 936 Calle Miramar, Redondo Beach, Calif.

Filed May 6, 1970, Ser. No. 34,978

Int. Cl. H02g *15/00*

U.S. Cl. 29—629 **19 Claims**


Select Mating Connector Contacts
Connect Connector Contacts To Wires
Insert Connector Contacts Onto Corresponding Terminals and Form Reservoir with Mylar Strip
Test Wired Contacts
Inject Melted Thermoplastic Material into Reservoir
Harden Thermoplastic and Remove Formed Connector

The disclosure describes a method of manufacturing in situs a mating electrical connector for a pre-existing installed connector. This is accomplished by installing wired mating connector contacts into engagement with corresponding connector contacts of the pre-existing connector. A strip of material, suitably Mylar, is then wrapped about the face of the pre-existing connector to form a reservoir which contains the installed connector contacts. The reservoir is subsequently filled with heated softened flowable thermoplastic material, suitably low density polyethylene, and the thermoplastic material is then allowed to harden which leaves remaining in the reservoir a hardened body of thermoplastic material in which the installed mating connector contacts are firmly anchored and the body is easily separated from the face of the pre-existing connector. The Mylar strip is then removed and the formed connector may be left in location or removed and reinserted as otherwise desired in the same manner as any other electrical connector.

3,664,019

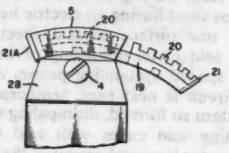
MECHANICALLY HELD INNER KNIVES OF SHEARHEADS OUTSIDE SAID HEADS ON ELECTRICAL AND MECHANICAL SHAVERS

Paul Kobler, Lynbrook, N.Y.

Filed Nov. 13, 1968, Ser. No. 785,842

Int. Cl. B26b *19/38*

U.S. Cl. 30—41 **5 Claims**



This disclosure relates to a razor having means to aid in cleaning the cutting blades or knives without completely removing them from the razor. The inner cutting blades are slidably mounted within a shearhead in such a manner that they can be moved to a position substantially without said shearhead but attached thereto to expose such blades for cleaning purposes.

3,664,020

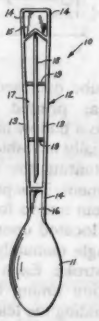
COMBINATION SPOON AND TOOTHPICK

Arthur W. Hammond, 5144 Soldiers Home-Miamisburg Rd., Miamisburg, Ohio, and Marie E. Miller, 1804 Rainbow Dr., Kettering, Ohio

Filed Mar. 18, 1971, Ser. No. 125,568

Int. Cl. B25f *1/00*

U.S. Cl. 30—142 **4 Claims**



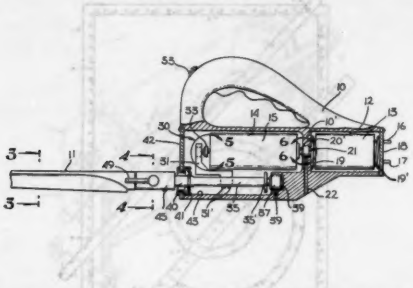
A toothpick and spoon combination includes a handle portion with a separatable toothpick member for use after eating. The combination utilizes support members from which the toothpick may be broken away.

3,664,021

KNIFE

Harold T. Sawyer, Pacific Palisades, Calif., assignor to Vernon D. Beeler, Los Angeles, Calif., a part interest

Filed Oct. 30, 1969, Ser. No. 872,690
Int. Cl. B26b 7/00
U.S. Cl. 30—272 9 Claims



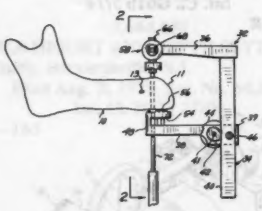
A power actuated knife with a single blade attached to a free end of a support, the other end of the support being attached to the handle. One end of the motor casing is attached to the handle through a vibration absorbing bearing and the motor at the other end has a rotatable oscillating connection to a bracket which engages the support at a location removed from its attachment to the handle whereby an oscillating sinusoidal motion is applied to the blade through the support to set the entire blade in motion.

3,664,022

DRILL GUIDE FOR MANDIBULAR STAPLE AND STAPLE CONSTRUCTION

Irwin A. Small, 751 Chestnut, Birmingham, Mich.

Filed Jan. 28, 1971, Ser. No. 110,503
Int. Cl. A61c 13/00
U.S. Cl. 32—2 13 Claims



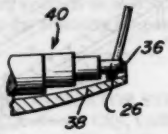
A drill guide for mandibular staples is disclosed which is adapted to accurately align a drill for drilling fastener holes in the mandibular lower jaw portion at precisely located positions for the attachment of fasteners therethrough by means of a staple to retain a dental appliance in secure position on the mandibular jaw portion; the method includes the construction of a staple which has a lower cross plate which is curvilinearly shaped to conform to the curvilinear shape of the front section of the jaw bone and to which are attached a plurality of fastener members adapted to protrude into and selectively through the jaw bone in accordance with the holes previously drilled through the jaw bone by means of the drill guide; the staple and the fastening portions of the staple are coated with a bio-ceramic such as aluminum oxide, titanium oxide, magnesium oxide, or the like, applied to the staple in open pore form to permit the bone tissue of the mandibular jaw to grow into the porous bio-ceramic coating to provide an additional interlock of the staple with the mandibular jaw tissues and to prevent bone deterioration due to the drilling operation and insertion of the metal staple.

3,664,023

ORTHODONTIC SEPARATING SPRING

Horace E. Pool, 406 West 26th St., North Little Rock, Ark.

Filed Nov. 6, 1970, Ser. No. 87,563
Int. Cl. A61c 7/00
U.S. Cl. 32—14 E 11 Claims



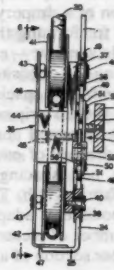
A spring wire device having a special planar configuration is inserted between two teeth to be separated in preparation for orthodontic banding. An activating portion of the inserted device projecting from the teeth is crimped by a bending plier to effect relative lateral deformation of occlusal and gingival arm portions exerting spreading forces on the teeth.

3,664,024

RETRIEVER FOR DENTAL SALIVA EJECTOR

Dean H. Buchtel, and John A. Maurer, both of Canton, Ohio, assignors to The Weber Dental Manufacturing Company, Canton, Ohio

Filed Dec. 30, 1970, Ser. No. 102,698
Int. Cl. A61c 19/02
U.S. Cl. 32—22 25 Claims



A retriever construction for positioning, retrieving and storing a flexible hose of a dental saliva ejector preferably within a dental console. A traveling car is slidably mounted on a vertical post having a fixed pulley at its upper end. The car has a pair of spaced pulleys and a locking mechanism. The ejector hose is looped around the fixed and car pulleys so that the car moves upward on the post as the hose is extended outward for use. The locking mechanism is selectively engaged in one of a plurality of positioning notches formed on the post and holds the hose in various extended positions of the hose. The car automatically returns the hose to retracted hose storage position looped around the pulleys when the locking mechanism is released upon full extension of the hose.

3,664,025

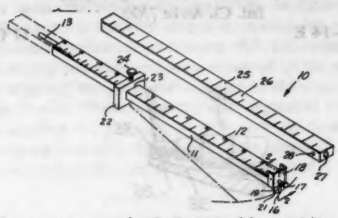
SCRIBER

Floyd D. Barto, 508 Maple St., Hurley, Wis.

Filed June 26, 1970, Ser. No. 50,072
Int. Cl. B43l 9/04
U.S. Cl. 33—27 C 1 Claim

A scriber which includes an elongate bar having add on sections attachable thereto for increasing the length. The bar has a butt guide mounted thereon and including a swivel

point for centering the bar to permit it to be swung. A combination cutting blade and marking point is detachably secured to one end of the scriber to permit work to be



marked or cut as required. A rotatable marking wheel may be detachably secured to the scriber bar in place of the combination marking and cutting blade.

3,664,026

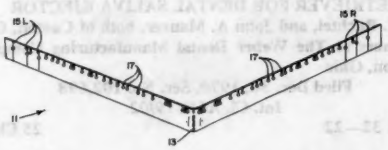
DRAPERY PLEATING PATTERN MEANS

Jack M. Lawson, 3161 Ashwood Ave., Memphis, Tenn.

Filed Aug. 22, 1969, Ser. No. 852,271

Int. Cl. G01b *3/10*

U.S. Cl. 33—137 **8 Claims**



A paper or fabric pattern strip adapted for use in making the pleated upper section of a drapery panel. Two such pattern strips may be used for forming the pleated section of a pair of drapes for a single window — each pattern strip being adapted for use in forming the opposite side hems and return or border areas and in uniformly spacing the pleated areas of a drapery. By use of the pattern strip of the invention, several widths of fabric may be hemmed and pleated to a certain width with the pleated drapery of each fabric width having uniform pleat spacings and spacings equal to the pleat spacings of each other fabric width. The pattern strip means preferably is in two embodiments adapted for use respectively in forming an odd number of pleats or an even number of pleats in the pleated upper section of a drapery panel.

3,664,027

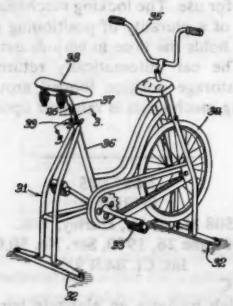
BICYCLE FRAME-SIZE INDICATOR

Albert J. Fritz, Wilmette, and Rudolph L. Schwinn, Niles, both of Ill., assignors to Schwinn Bicycle Company, Chicago, Ill.

Filed Aug. 12, 1970, Ser. No. 63,065

Int. Cl. B62k *17/00, 19/00*

U.S. Cl. 33—174 R **4 Claims**



Measuring device for accurately determining under use conditions the proper size bicycle frame for any rider.

3,664,028

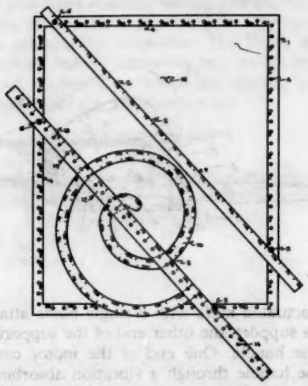
DRAWING DEVICE OR APPARATUS

Donald C. Smith, 132 Bartley Ave., Mansfield, Ohio

Filed May 4, 1970, Ser. No. 34,364

Int. Cl. B43l *13/20*

U.S. Cl. 33—174 B **2 Claims**



A device or apparatus which is utilized for drawing pictures or other designs on paper or other material by using a formula, and which includes a drawing board and flat rectangular and spiral shaped members which are mounted thereto in various positions, segments of the periphery of said members providing a guide for drawing lines which produce the picture or design predetermined by the formula.

3,664,029

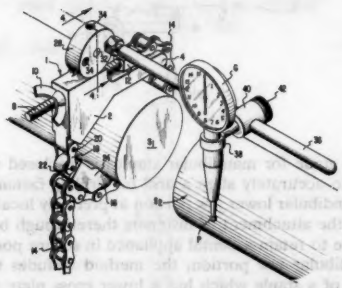
DIAL INDICATOR HOLDER

Harold Glucoft, 1351 Sunset Ave, Santa Monica, Calif., and James Westerfield, 19 N. Margerita. Apt. #15, Alhambra, Calif.

Filed Feb. 2, 1970, Ser. No. 7,712

Int. Cl. G01b *5/14*

U.S. Cl. 33—180 R **11 Claims**



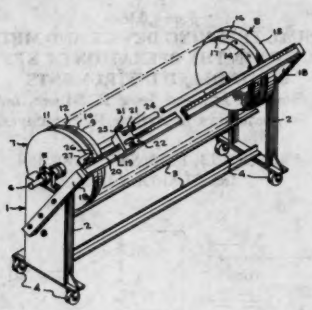
An easily attachable shaft aligning apparatus comprises a gauge carrying head member having a pair of angularly related arms which make contact with a shaft or axle to be aligned with a second shaft or axle. A belt or chain extends about the shaft or axle and has one end adjustably supported on one arm, the other arm being provided with a linked extension which also contacts the shaft and is provided with an outward projection for passing through a link in the chain or an opening in the belt, whereby when the chain is tightened by the adjustment the head member is securely held to the shaft or axle.

3,664,030

APPARATUS FOR MAKING ROTARY CUTTING DIES

Joseph O. Pope, Jr., 395 Carey Drive, S. E., Atlanta, Ga.

Filed June 11, 1969, Ser. No. 832,271
Int. Cl. B41b 1/00
U.S. Cl. 33—184.5 8 Claims



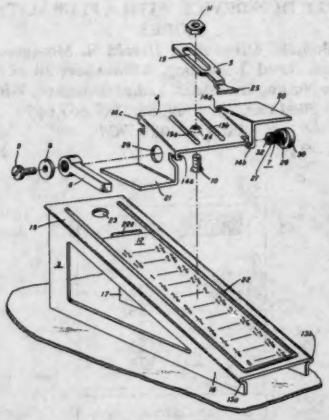
Apparatus for making dies for rotary cutting cylinders which is portable and has spaced circular mounting heads upon which a die board can be mounted for scribing, drilling, cutting, etc. One of the die heads carries a true measurement scale about its circumference, the scale being annular and concentric with the mounting die board, and spaced from the outer cylindrical surface of the die board a distance equal to the proposed projection of the cutting rules from the board surface when mounted. A tool holder is mounted on a graduated indexing bar for movement longitudinally of the cylinder, and has a tool opening having its axis radial to the cylinder. There is an index pointer over the circumferential scale on the mounting head having its point in a plane radial to the cylinder which includes the tool opening axis. This allows true measurement scales to be used throughout and the points of contact of a tool in the tool holder with the die board to form a proper circumferentially shrunken image of the article which the completed die is to cut.

3,664,031

PORTABLE HEIGHT AND DEPTH SETTING GAUGE

Edward J. Duffy, Bernardsville, N.J.

Filed Aug. 3, 1970, Ser. No. 60,595
Int. Cl. B27g 23/00
U.S. Cl. 33—185 7 Claims



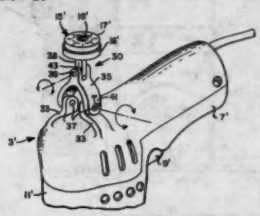
A gauge having two direct reading scales and comprising a triangular framework and gauge head slidably mounted thereon is disclosed. The head includes two sideward extending members, both of which can be moved to a so called setting position by sliding the head along an inclined surface of the framework. A pointer extends from the head for indicating on the appropriate scale, directly, the distance between a reference surface and tool surfaces coming into contact with either member. An arrangement for clamping the head in the setting position as well as an arrangement for calibrating scales and for adjusting for parts wear is included.

3,664,032

TOOL-LEVEL INDICATOR STRUCTURE

Charles A. Tompkins, Redwood City, Calif., assignor to Ketsy Eileen Tompkins, Redwood City, Calif., a part interest

Filed July 23, 1970, Ser. No. 57,564
Int. Cl. G01c 9/28
U.S. Cl. 33—207 R 2 Claims



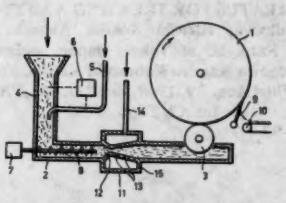
A tool for working on an object positioned at an angle relative to a reference plane, sand tool including a level indicator to indicate the angular relationship of said tool to said object and said reference plane.

3,664,033

METHOD AND APPARATUS FOR DRYING ORGANIC MATERIALS

Hartwig Fritze; Wolfhart Eisenmann, and Max Preger, all of Ravensburg, Germany, assignors to Escher Wyss GmbH, Ravensburg, Wurthemberg, Germany

Filed Aug. 11, 1970, Ser. No. 62,904
Claims priority, application Germany, Aug. 14, 1969, P 19 41 425.6
Int. Cl. F26b 7/00
U.S. Cl. 34—12 11 Claims



In a method for drying a material at least mainly consisting of organic substances such as carbohydrates and proteins, using a drum drier as to dry said material thereon, the improvement that said material is heated to a temperature at which its constituents are liquid, and is applied in said liquid state to the drying drum of said drum drier. Preferably, said material includes additives such as alkalis, acids or enzymes.

3,664,034

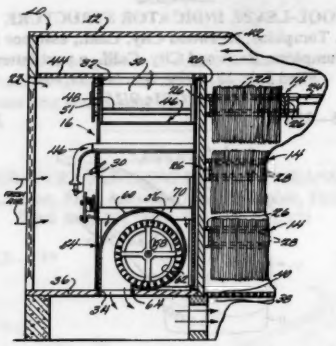
TOBACCO BULK CURING SYSTEM WITH IMPROVED CURING AIR FLOW RATE CONTROL

Robert W. Wilson, Charlotte, N.C., assignor to R. H. Bouligny, Inc., Charlotte, N.C.

Filed Sept. 23, 1970, Ser. No. 74,678
Int. Cl. A24b 1/02
U.S. Cl. 34—225 5 Claims

A system of curing flue-cured tobacco in bulk including a barn structure having perforated floor defining a curing air

inlet space therebelow and tobacco loading and curing space thereabove for receiving and supporting a plurality of bulk curing racks disposed in side-by-side relation and in a plurality of vertically spaced tiers, a return air space above the loading space and a curing air conditioning and circulating assembly including a housing having an inlet communicating with the upper return air space, an outlet communicating with the lower curing air space, damper controlled fresh air inlets adjacent the upper end thereof, an air heater, a blower and an improved air throttling mechanism for controlling the amount of curing air circulated throughout the cure so that



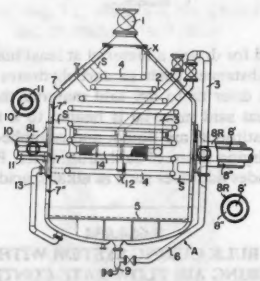
(1) the yellowing of the leaves is accomplished with the curing air at the desired temperature and relative humidity flowing at a relatively slow rate within an operative range of between 10 and 50 cubic feet per minute for each square foot of effective curing area, and within a preferred range of 40 to 45 cfm and (2) drying of the leaves is accomplished with the curing air at the desired temperatures and relative humidities flowing at a relatively high rate within an operative range of 50 to 120 cfm for each square foot of effective curing area with an increase of at least 10 percent of the flow rate during yellowing and within a preferred range of 55 to 75 cfm and an increase of at least 30 percent.

3,664,035

APPARATUS FOR TREATING A MIXTURE

Yoshio Yoshikawa; Hiroshi Kondo; Akitoshi Sugio, and Tomotake Kato, all of Tokyo, Japan, assignors to Mitsubishi Edogawa Kagaku Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 19, 1969, Ser. No. 851,396
Int. Cl. F26b *13/30*
U.S. Cl. 34—92 **6 Claims**



The apparatus of this invention is suitable for treating a labile material in a state free from deteriorating factors. suction vessel,

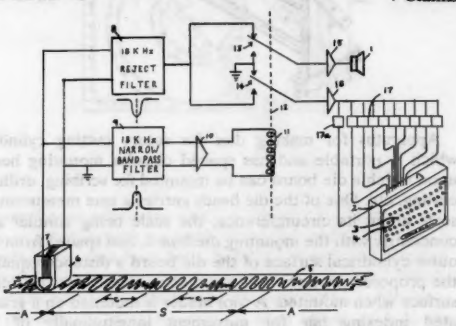
Filtration, washing, drying and mixing operations can be effected in this single apparatus. The apparatus comprises a vessel, a filter plate, cylindrical rotating shafts, and a suction member rotatable together with the vessel. , the suction member is located at a site where the material to be treated does not contact the suction member while rotating the vessel.

3,664,036

AUDIO-VISUAL TEACHING DEVICE AND METHOD FOR INSTRUCTION IN THE OPERATION OF KEYBOARD CONTROLLED INSTRUMENTS

John E. E. Boswell, Jr., and Jesse H. Miner, both of Falls Church, Va., assignors to Arthur R. Schmoyer, Potomac, Md.

Filed Oct. 13, 1970, Ser. No. 80,354
Int. Cl. G09b *13/02*
U.S. Cl. 35—6 **7 Claims**



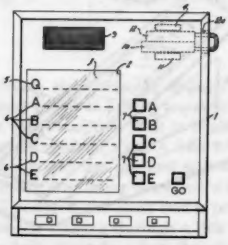
An apparatus for teaching the operation of a keyboard instrument comprises audio and visual components actuated respectively by voice signals and cueing signals both recorded at audio frequencies on a single "track" of magnetic medium. The cueing signals are superimposed on an audio inhibit signal of a preselected frequency which may or may not be within audio range and which is effective through a filter network to switch the apparatus from an audio mode to a visual mode in advance of the cueing signals and to maintain the apparatus in the visual mode during decoding of the cueing signals. Alternatively, cueing signals of brief duration are used to trigger a latching circuit to hold a visual indicator activated while further audio instructions are reproduced, and a subsequent cueing signal serves to unlatch the circuit to terminate the visual indication.

3,664,037

INSTRUCTION DEVICE WITH A PLURALITY OF MODES

Roger J. Budnik, Milwaukee; Harold S. Montgomery, Fox Point, and David J. Nutting, Milwaukee, all of Wis., assignors to Nutting Industries, Ltd., Milwaukee, Wis.

Filed Oct. 20, 1969, Ser. No. 867,669
Int. Cl. G09b *7/08*
U.S. Cl. 35—9 B **27 Claims**



A film projector presents film frames in sequence. The lateral edge of the film adjacent each frame is a dark surface

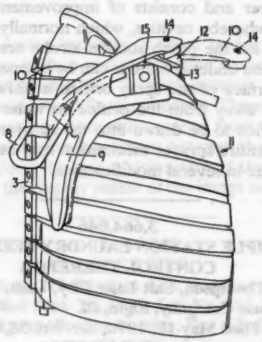
having eight code spots for answer selection and a three bit binary code. The code spots are dark or clear and read by a photocell. A sound tape machine includes three audio channels and a control channel having a high frequency advance signal and a low frequency tape stop signal. A binary decoder establishes output power at one of a plurality of power lines. A matrix board connects the power leads to control lines through diodes. The control lines are connected to branch circuits of a master control to operate the film projector and the tape machine in predetermined sequences with the output of the tape machine establishing an automatic film advance or a semi-automatic film advance. A film frame may provide a question and multiple choice answers. A response circuit includes a correct answer relay and an incorrect answer relay selectively connected in the master circuit to establish an interrelated control of the projector and tape machine.

3,664,038

HUMAN SIMULATIONS (DUMMIES)

John Albert Searle, Market Bosworth, and Dennis William Perrin, Fenny Drayton, both of England, assignors to Motor Industry Research Association, Lindley, near Nuneaton, Warwickshire, England

Filed Aug. 10, 1970, Ser. No. 62,501
Claims priority, application Great Britain, Aug. 8, 1969, 39,876/69
Int. Cl. G09b *23/32*
U.S. Cl. 35—17 **8 Claims**



In a dummy simulating the human shoulder region, the shoulder joint is constrained to move in an arcuate path corresponding to the natural shoulder joint, by a guiderod secured to the spine region of the dummy. The rod is resilient and there is vertical play between the rod and the shoulder joint member. The latter may be pivotably connected to the sternum region.

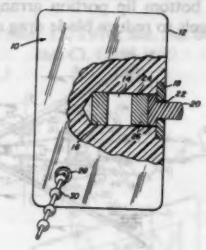
3,664,039

NOVELTY KEY CHAIN

Palmer P. Derby, Weston, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Apr. 6, 1971, Ser. No. 131,617
Int. Cl. G09b *23/06*
U.S. Cl. 35—19 A **5 Claims**

A novelty key chain which comprises a body of transparent rigid material having a bore in one side thereof in the base of which is disposed a first magnet, and a push button slidably disposed in the outer portion of the bore with a second magnet on its inner end, the adjacent ends of the magnets being



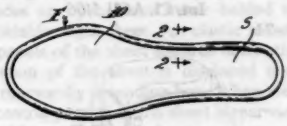
of like polarity so as to normally maintain the push button in extended position.

3,664,040

SHOE SOLE AND METHOD OF MAKING IT

Emil R. Ouimet, 31 Country Club Drive, Brockton, Mass.

Continuation of application Ser. No. 643,501, June 5, 1967, now abandoned. This application Aug. 5, 1970, Ser. No. 61,515
Int. Cl. A43b *13/00*
U.S. Cl. 36—25 R **1 Claim**



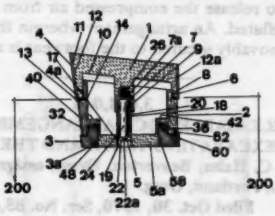
A sole element for shoes having an edge band of thermoplastic material in lieu of a textile or other tape, and a method of making it.

3,664,041

HEEL WITH ORNAMENTAL MASK

Michele Frattallone, Fulvia Villa Piazza Parte Guelfa, 3/50123 Firenze, Italy

Filed Feb. 9, 1970, Ser. No. 9,943
Claims priority, application Italy, Feb. 13, 1969, 4.462 A/69
Int. Cl. A43b *21/36*
U.S. Cl. 36—42 **1 Claim**



A heel containing an upper section permanently attached to the shoe, a detachable lower section and a detachable mask covering the upper section.

3,664,042

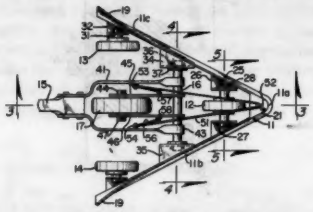
HAND OPERATED WHEELED V-BLADE SNOWPLOW

Conrado E. Duran, 71 South Xavier, Denver, Colo.

Filed June 11, 1970, Ser. No. 45,280
Int. Cl. E01h *5/02*
U.S. Cl. 37—47 **7 Claims**

A snowplow particularly adapted to be manually propelled includes a wheel-mounted scraper blade arranged to direct

snow laterally. The blade has relatively rigid sides with rear portions being curled outwardly at the upper rear end to provide a concavely curved moldboard, a front apex together with a resilient bottom lip portion arranged relative to the plane of the wheels to reduce blade drag and provide a clean



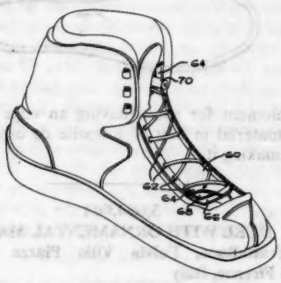
scraping action. A shaft connected transversely between the sides of the blade serves as lateral blade support structure and in addition supports both a pivotal handle and a trailing alignment wheel. The handle is cable-connected to the blade and alignment wheel in such a way that the blade may be elevated or the wheel elevated to maneuver the blade.

3,664,043

ACCESSORY FOR FOOTWEAR

Emile A. Polumbus, Jr., 3475 South Race St., Englewood, Colo.

Filed Oct. 14, 1970, Ser. No. 80,573
Int. Cl. A61l *5/00*
U.S. Cl. 36—71 **2 Claims**



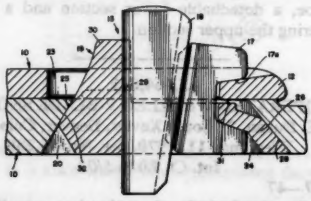
A tightening device for footwear includes an elongated air tight inflatable pad enclosed in the footwear and means for injecting compressed air into the pad so that it expands drawing the footwear tightly to the foot. Valve means are also provided to release the compressed air from the pad when it is to be deflated. An arrangement wherein the inflatable pad can be removably secured to the footwear is also disclosed.

3,664,044

RELEASABLE LOCK ARRANGEMENT FOR EXCAVATING TEETH AND THE LIKE

Frederick C. Hahn, Beaverton, Oreg., assignor to Esco Corporation, Portland, Oreg.

Filed Oct. 30, 1970, Ser. No. 85,409
Int. Cl. E02f *9/28*
U.S. Cl. 37—142 R **6 Claims**



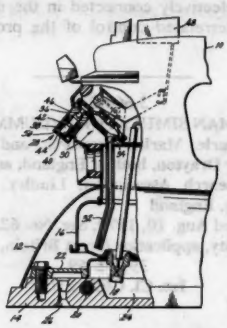
A replaceable bushing capable of self-supporting seating in the aperture of an excavator lip whereby worn bearing areas are easily and mechanically replaced, and thereby function better to support and tie an adapter or other excavating teeth components to the excavator.

3,664,045

SPRAY IRON

Wendell C. Walker, Alta Loma, and William E. Davidson, Ontario, both of Calif., assignors to General Electric Company

Filed Sept. 23, 1970, Ser. No. 74,627
Int. Cl. D06f *75/06*
U.S. Cl. 38—77.5 **6 Claims**



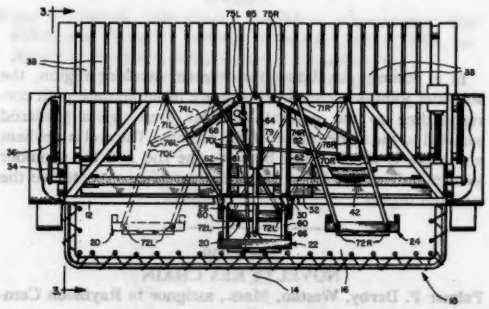
The invention is directed to an electric flatiron equipped with a sprayer and consists of improvements in the spray mechanism whereby cavities, which normally trap undesired air or water on the pump suction stroke are filled, so that, structurally, no undesired fluids can be trapped. Additionally, the outer surface of the spray orifice is dished to provide a natural path away from the orifice so water does not form over the orifice to be drawn into the sprayer on the suction stroke. The entire sprayer mechanism may be a non-metallic molded plastic in several modifications.

3,664,046

MULTIPLE STATION LAUNDRY FEEDER AND CONTROL THEREFOR

Richard D. Thompson, Salt Lake City, Utah, assignor to McGraw-Edison Company, Elgin, Ill.

Filed May 18, 1970, Ser. No. 38,439
Int. Cl. D06f *67/04*
U.S. Cl. 38—143 **15 Claims**



A flatwork laundry feeder having a plurality of stations or transfer mechanisms each movable between its loading position whereat an operator can secure a laundry article thereon and a common unloading position whereat the laundry article can be separated from the mechanism and subsequently handled by common equipment, and a control for operating the

mechanisms independently on a first-come, first-serve basis as determined by the sequence in which the operators signal for each unloading cycle to begin, where the demand signal of any mechanism is stored if necessary until that mechanism is unloaded.

3,664,047

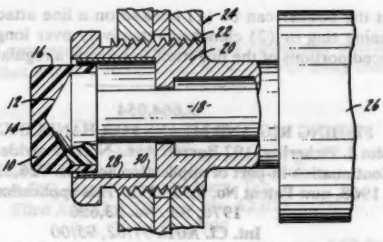
LINEAR PRISM DISPLAY

Albert L. Ruppert, Middleton, Wis., assignor to Oak Electro/Netics Corp., Crystal Lake, Ill.

Continuation-in-part of application Ser. No. 747,717, July 25, 1968, now abandoned. This application May 19, 1969, Ser. No. 825,487

Int. Cl. G09f *11/00*

U.S. Cl. 40—28 R 31 Claims



A display device including a prism having an object surface, an image surface and a reflecting surface. The reflecting surface is symmetrical in configuration and the object surface is outside the reflecting surface. There is indicia positioned adjacent and outwardly spaced from the object surface such that relative movement between the object surface and indicia along the axis of symmetry of the reflecting surface changes the display visible at the image surface.

3,664,048

CARD FILE

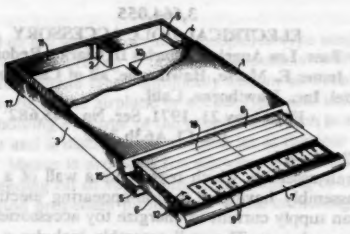
Lauri E. Karlsson, 13 Solvagen Alta, Sweden

Filed Sept. 26, 1969, Ser. No. 861,331

Claims priority, application Sweden, Dec. 13, 1968, 17080/68

Int. Cl. G09f *11/30*

U.S. Cl. 40—65 4 Claims



A telephone number index having a casing with a stack of cards slidably supported in said casing for being slid in and out of said casing, a slot in the inner edge of said cards and a projection in an end of said casing of a size, shape and position for entering said card slots to frictionally engage said cards tending to retain the cards in said casing until one or more of said cards is slid outwardly of the casing by a user thereof.

3,664,049

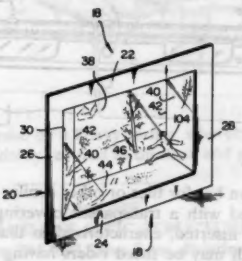
SELF-ERECTING SHADOW BOX

Irving Smith, c/o Arrow Art Finishers, 1201 Evergreen Ave., Bronx, N.Y.

Filed Nov. 12, 1970, Ser. No. 88,552

Int. Cl. G09f *1/00*

U.S. Cl. 40—124.1 16 Claims



A self-erecting shadow box made of paperboard, or the like, for example, for use as a display means or a greeting card, includes an open front frame behind which is positioned a foldable, rigid sheet. An elastic member is used to draw side panels of the sheet towards each other so that the central portion of the sheet is displaced rearwardly, thus creating a rearwardly extending box. When viewed from the front, the central portion of the sheet is rearward of the open frame, the side panels of the sheet converge and the bottom panel slants upwardly, thus creating an illusion of additional depth. The shadow box is initially contained within an envelope which holds it flat and when it is removed therefrom the elastic means will automatically erect the shadow box.

3,664,050

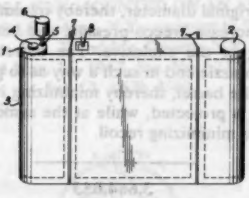
INTRODUCED IN LUMINOUS PUBLICITY DISPLAYS OF CONTINUOUS SASH TYPE

Alejandro C. Manzano, Madrid 10, La Baneza 10-11, Madrid, Spain

Filed Mar. 9, 1970, Ser. No. 17,848

Int. Cl. G09f *11/28*

U.S. Cl. 40—32 5 Claims



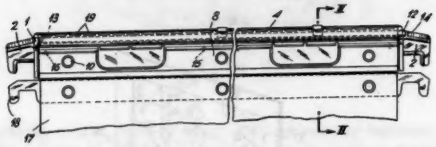
A continuous sash type luminous display having an image carrying sash mounted on a pair of rollers, one of said rollers being coupled to a drive motor. Switch means are provided in the path of end-of-display members for actuation of said switch means to turn said motor off. Timing circuitry coupled to said motor is also provided for automatically restarting said motor after the passage of a predetermined period of time. Means are also provided for automatically opening and closing a pair of curtains during the cycle.

3,664,051

SUSPENSION BAR FOR FILES OR OTHER SIMILAR OBJECTS

Marcel M. Benichou, Saint-Cloud, France, assignor to L'Organisation Economique Moderne, Paris, France

Filed Apr. 6, 1970, Ser. No. 25,631
Claims priority, application France, Apr. 11, 1969, 6911247
Int. Cl. B42f *15/04*
U.S. Cl. 40—359 2 Claims



A suspension bar for files or other similar objects, said bar being provided with a transparent covering under which a label may be inserted, characterized in that the bar has an edge on which may be fitted riders having an extension intended to be lodged under the transparent covering, the latter having slots intended to prevent the lateral displacement of the riders once the latter have been put in place. Riders and labels for use with the suspension bar are also provided.

3,664,052

IMPACT ACTUATED UNDERWATER GUN

Bruce Mounier, 9321 S.W. 80th Terrace, Miami, Fla.

Filed Apr. 2, 1970, Ser. No. 25,198
Int. Cl. F41c *17/00, 21/00*
U.S. Cl. 42—1 L 5 Claims

An underwater impact actuated gun comprising a pole member used as a handle for thrusting against a fish to be shot and having a comparatively short gun barrel at the striking end. A weighted firing pin slidably arranged behind the cartridge by a compression spring is carried forward by its momentum upon striking a fish with the muzzle of the gun to fire the cartridge. The barrel is slightly tapered just in front of the cartridge slug, convergently in the direction of the muzzle end, to effect deformation of the slug to a diameter less than its original diameter, thereby minimizing blow-by to appreciably increase breech pressure and heat for more efficient burning of the explosive. The barrel is peripherally vented at its muzzle end in such a way as to permit escape of the water in the barrel, thereby minimizing its retardation of the slug as it is projected, while at the same time providing reactive forces minimizing recoil.

3,664,053

MULTIPURPOSE BOBBER

Rheinhardt J. Beverly, 4602 East 14th St., Tucson, Ariz.

Filed May 7, 1970, Ser. No. 35,515
Int. Cl. A01k *93/00, 91/00*
U.S. Cl. 43—43.14 5 Claims

A multipurpose bobber comprising a hollow body of suitable size and shape and made of squeezable self-shape restoring material similar to that which is currently used in making squeezable plastic bottles, squeeze-bulbs and the like. It can be charged with water to vary its relative buoyancy. It has suitably aligned stoppers operatively mounted in its opposite ends. An enclosed stiff wire or rod has hooks at its ends and when the median portion of the body is squeezed both hooked ends of the rod are caused to project in a manner

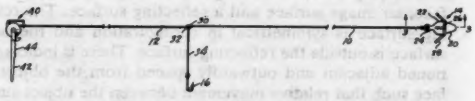
that the bobber can be (1) hooked on a line attaching, line running ring or (2) clenched retentively over longitudinally spaced portions of the line itself to provide a regular bobber.

3,664,054

FISHING RIG AND MEANS FOR HANDLING SAME

John J. Pickering, 102 Barrett Ave., North Providence, R.I.

Continuation-in-part of application Ser. No. 726,520, May 3, 1968, now Patent No. 3,525,173. This application May 1, 1970, Ser. No. 33,656
Int. Cl. A01k *91/02, 95/00*
U.S. Cl. 43—19 5 Claims



A fishing rig comprising: a length of elastic line having a self-anchoring sinker attached to one end. The elastic line is spliced to a length of conventional line at the end of the elastic line opposite the sinker. One or more hooks are attached to the conventional line adjacent its junction with the elastic line.

The means for handling the rig aforesaid comprises a reel on which the two lines are stored with a downwardly projecting handle capable of being inserted in a socket provided in a gunwale of a boat or dug into the beach, if the fishing rig is to be cast in the manner of a handline.

3,664,055

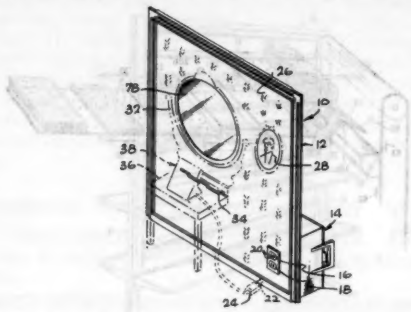
ELECTRICAL DOLL ACCESSORY

Sidney Bass, Los Angeles; Charles D. Clarke, Redondo Beach, and James E. Morse, Hawthorne, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed May 21, 1971, Ser. No. 145,682
Int. Cl. A63h *3/52*
U.S. Cl. 46—45 8 Claims

A wall assembly which represents a wall of a home, the wall assembly having a natural-appearing electrical outlet that can supply current to energize toy accessories that have motors or lamps. The wall assembly includes a sheet that represents the wall of a home, and a battery box with a plug-receiving portion projecting through a hole in the wall to represent an electrical outlet. The battery box supports the wall in a substantially vertical orientation on a table or the like. A decorative paper label printed with a wallpaper pattern and with regions representing a picture and a mirror hung on the wall, is applied to the front wall surface to cover most of it, thereby permitting the same wall structure to be used for different rooms in the home by merely using a different label for each room. A makeup mirror accessory is

provided which has an electric lamp that can be energized from the outlet, the mirror accessory constructed so it can be



switched to represent day or evening type lighting by operating a lever that moves a red-colored hood over or away from the lamp.

3,664,056

JET PROPELLED MODEL VEHICLE

Victor Stanzel, P.O. Box 28, Schulenburg, Tex.

Filed Aug. 7, 1970, Ser. No. 62,071

Int. Cl. A63h *27/00*

U.S. Cl. 46—74 A 4 Claims

A model or toy vehicle of the jet propelled type employing a rapidly vaporizing liquid propellant of the chlorofluoromethane type, commonly known as Freon. The vehicle may be of the airplane or rocket type, and includes a barrel for holding a charge of the propellant which is allowed to vaporize and is discharged through a jet at the rear end of the barrel. Means is provided for allowing the escape of air and the bleeding off of vapor during the charging of the barrel with liquid propellant preliminary to the launching of the craft.

3,664,057

MOUNTING ASSEMBLY

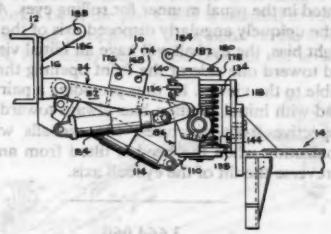
Thomas J. Dunn, P.O. Box 110, Hackettstown, N.J.

Filed Mar. 18, 1970, Ser. No. 20,601

Int. Cl. A01d *69/00*

U.S. Cl. 56—10.4 6 Claims

A lift and breakaway mounting assembly for connecting an implement to a prime mover includes a laterally mounted hinge plate with a spring case. The plate is pivotal with respect to the prime mover, and the case is pivotal with respect to the plate. An implement mount is operatively associated with the case by a heavy spring, whereby the implement mount is yieldably secured to the case and plate.



3,664,058

INFLATABLE PLASTIC STRUCTURES

Bernard F. Brieske, 241 Tall Trees Lane, Palatine, Ill.

Filed Apr. 19, 1971, Ser. No. 135,127

Int. Cl. A63h *3/06*

U.S. Cl. 46—90 4 Claims

An inflatable plastic construction formed of multiple layers of plastic sheets. Transparent exterior sheets are located adjacent interior sheets with printing substances being disposed between the facing surfaces of the respective sheets. An air holding space is defined between the interior sheets. The assembly is heat sealed all around its periphery with the exception of an area provided for a valve mechanism. The valve mechanism is formed from the sheet material, and it permits the introduction of air but inhibits the release of air whereby the structure remains inflated.

3,664,059

ROLLING DOLL EYE MOUNTED ON AN ASKEW AXIS

William Leibowitz, Flushing, N.Y., assignor to Dollac Division Jacoby-Bender, Inc., Woodside, Queens, N.Y.

Filed Mar. 15, 1967, Ser. No. 623,250

Int. Cl. A63h *3/40*

U.S. Cl. 46—167 9 Claims

The invention provides a doll eye unit wherein the eyeball has a side to side or rolling motion. The unit has a front shell with a front visibility opening or aperture, and in which is

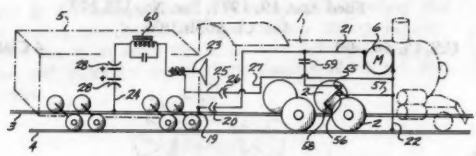
pivotally mounted an eyeball having a pivotal axis at tilted angle to a horizontal plane but contained in a vertical plane parallel to the general plane of the front opening. The eyeball is weighted in the usual manner for rolling eyes. Accordingly, due to the uniquely angularly disposed axis of the eyeball and the weight bias, the eyeball will have an initial visible portion oriented toward one side of the front opening through which it is visible to the viewer. By thus providing a pair of eyes in a doll head with initial rotation bias always toward one side of the respective front apertures, the eyeballs will move in synchronization when the head is tilted from an erect position to reverse the tilt of the eyeball axis.

3,664,060

MODEL RAILROAD ELECTRIC LOCOMOTIVE SOUND SYSTEM

Robert H. Longnecker, Glen Mills, Pa., assignor to Pacific Fast Mail, Edmonds, Wash.

Filed Mar. 8, 1971, Ser. No. 121,701
Int. Cl. A63h *19/10, 19/14*
U.S. Cl. 46—232 **17 Claims**



An accessory includes a speaker mounted in the locomotive tender electrically driven by an audio frequency signal from one or more electronic sound generators simulating respectively a bell, escaping steam either from an engine exhaust, leakage or blowoff, and a whistle. The engine exhaust sound is timed by periodically grounding the radio frequency oscillator of a timing circuit for the escaping-steam-simulating generator by intermittently closing a switch in the circuit effected by rotation of a driver wheel of the locomotive. Selective controls enable the bell and whistle to be operated at will and further enable the nature of the sounds of the bell, exhaust and whistle to be modified. Direct current for the locomotive driving motor, the audio frequency signal to drive the speaker and the radio frequency signal to the locomotive-carried switch for timing the simulated engine exhaust are all simultaneously impressed on the two rails but electronic blocking components included in the circuit prevent the engine-driving direct current and the radio-frequency signaling current from interfering with the speaker operation and prevent the audio frequency signal and the radio frequency signal from leaking into the direct-current power circuit.

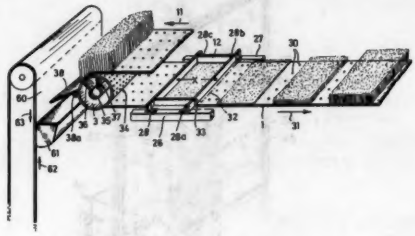
3,664,061

METHOD OF AND APPARATUS FOR THE DEVELOPMENT OF PLANT GROWTH

Karl Oepen, Gladbscherstrasse 28, 5 Koln, Germany

Continuation-in-part of application Ser. No. 705,747, Feb. 15, 1968, now abandoned. This application Mar. 3, 1971, Ser. No. 120,404
Int. Cl. A01g *31/00*
U.S. Cl. 47—1.2 **9 Claims**

A development of plant growth in which the seed material or the plants are supplied on an endless conveying means rotating in a horizontal plane to a plurality of successive treatment stations. The conveying means is constituted by a belt provided with a plurality of apertures and at the initiation of the growth, a seeding frame disposed on the belt limits the area of the seed material to be applied onto the belt. The frame or a portion thereof, is displaceable in such a fashion that upon movement of the belt by a length corresponding at least to the width of the frame, the seed material can be moved without difficulty by the frame to a position below the frame, together with the belt to the next treatment station.

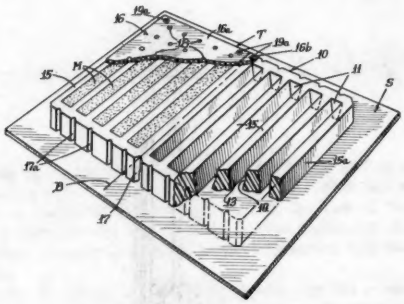


3,664,062

PLANT TRAY UNIT AND SHIPPING PACKAGE

Robert E. Danielson, West Chicago, Ill., assignor to Geo. J. Ball, Inc., West Chicago, Ill.

Filed Sept. 29, 1970, Ser. No. 76,404
Int. Cl. A01g *9/02*
U.S. Cl. 47—34.13 **5 Claims**



A plant tray unit for growing and shipping seedlings, cuttings, and the like, comprises a grid formed of rigid foam plastic, which provides a plurality of growing slots extending therethrough, the slots having sidewall portions converging upwardly and inwardly to restrict the upper portions of the slots for retaining plants and growth medium therein during handling and shipping. Separate plate means are provided for closing the bottom of the slots, which permits the grids to be filled with growth medium while in inverted condition, the bottoms attached, and the trays turned to their upright position for planting the seeds or cuttings. The tray units are adapted for incorporation in shipping package assemblies, the trays being enclosed in an outer carton, or forming sections of the package assembly.

3,664,063

PLANT GROWTH APPARATUS

R. Louis Ware, 2108 Middle Fork Road, Northfield, Ill.

Continuation-in-part of application Ser. No. 751,207, Aug. 8, 1968, now Patent No. 3,529,379. This application Sept. 21, 1970, Ser. No. 73,894
Int. Cl. A01g *9/02*
U.S. Cl. 47—39 **4 Claims**

A plant growth apparatus in which plants are supported on shelves and exposed to a predetermined level of illumination

by a bank of fluorescent tubes. To provide an aesthetically pleasing structure the ballast for the fluorescent tubes is ar-

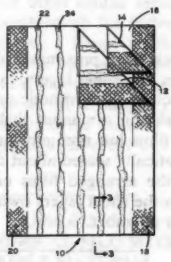
ranged and connected to provide a significant saving in wiring.

3,664,064

CLEANING AND POLISHING PAPER AND METHOD OF MAKING SAME

Fred F. Scheuer, Bronx, N.Y., assignor to Dustikin Products, Inc., Bronx, N.Y.

Filed Aug. 27, 1969, Ser. No. 863,740
Int. Cl. B24d *11/00*
U.S. Cl. 51—402 **11 Claims**



This invention relates to a disposable multilayer pliable sheet, which can be used for both cleaning and polishing metal, one side of the sheet having the cleaning ingredients and the other side having the polishing ingredients. The treated sheet and the method of preparing it are novel as the cleaning and polishing ingredients are mixed together and applied to the cleaning side of the assembled sheet, the cleaning ingredients of the mixture being retained by the cleaning side of the sheet and the polishing ingredients of the mixture passing through to the polishing side of the sheet.

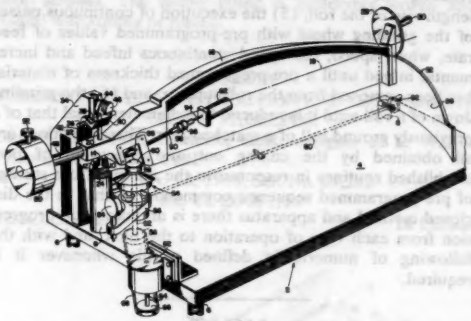
3,664,065

METHOD AND APPARATUS FOR GENERATING SURFACES OF REVOLUTION

James G. Baker, Winchester, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed May 1, 1970, Ser. No. 33,788
Int. Cl. B24b *17/04, 1/00*
U.S. Cl. 51—100 R **20 Claims**

Method and apparatus for generating, on optical material or metal, aspheric surfaces of revolution. Basically, the subject invention includes a lever arm pivotally mounted at one end portion thereof for simultaneous movement in at least two mutually orthogonal planes. The end portion of the lever arm remote from the pivot is adapted to ride upon and follow a cam surface so as to impart a predetermined motion to the lever arm. A tool is mounted on the lever arm, a predetermined distance from the pivot, and is adapted to rotate about an axis extending through the pivot point of the lever arm. A work blank is suitably positioned beneath the lever arm for



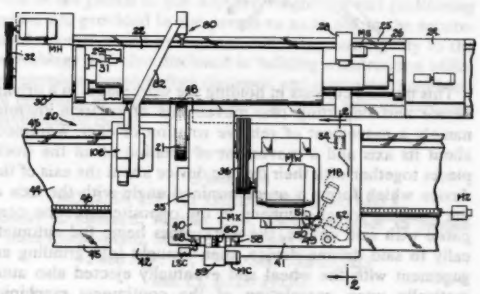
rotation about a vertical axis located a predetermined radial distance from the pivot point so that movement of the end portion of the lever arm in contact with the cam will be a linear amplification of the movement of the lever arm and, hence, the tool with respect to the work blank. The surface of the tool is adapted to make tangential contact with the surface of the work blank at all times and the blank may be vertically fed to control material removal.

3,664,066

METHOD AND APPARATUS FOR ALIGNING WORKPIECES

Stephen C. Clark, Jr., Phoenixville, Pa., assignor to The Ingersoll Milling Machine Company, Rockford, Ill.

Original application Jan. 10, 1969, Ser. No. 790,323. Divided and this application Jan. 25, 1971, Ser. No. 109,524
Int. Cl. B24b *5/04*
U.S. Cl. 51—165 TP **10 Claims**



Disclosed here are methods and automatic apparatus for grinding cylindrical workpieces, such as the contoured rolls used in metal rolling mills. The methods and apparatus involve (1) automatic finding of the lengthwise center of rolls of different and undetermined lengths so as to establish a reference position for the execution of a numerically programmed path defined relative to the center of a roll as a point of symmetry, (2) the storage of the successive instructions of multi-axis movements making up a numerically defined profile or contoured path, and the use of those instructions repeatedly and in whole or in part as called for by different ones of a sequence of commands read from storage and executed in succession, (3) the automatic alignment of the roll axis parallel to the longitudinal axis of motion in a

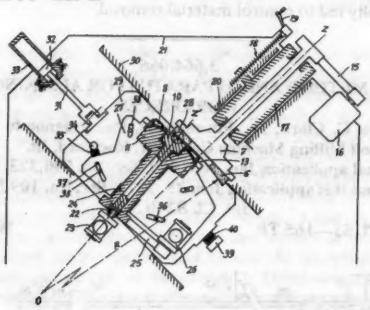
grinding machine by pivoting of one end of the roll about the other until the sensed difference in positions of the roll surface, along an axis transverse to the longitudinal axis and at locations near opposite ends of the roll, is changed to a predetermined fraction of the originally sensed difference, (4) the initiation of grinding passes from that end of a roll which is largest in diameter, so as to avoid "digging in" or increasing the depth of wheel bite as the wheel moves lengthwise of the roll, (5) the execution of continuous passes of the grinding wheel with pre-programmed values of feed rate, wheel speed, roll speed, continuous infeed and incremental infeed until a pre-programmed thickness of material has been removed from the roll surface, and (6) the grinding down of a roll until it is reduced to a diameter equal that of a previously ground roll of a matched pair. These functions are all obtained by the calling out and execution of pre-established routines in response to the reading from storage of pre-programmed sequence commands, so that in the disclosed method and apparatus there is an automatic progression from each type of operation to the next, and with the following of numerically defined profile whenever it is required.

3,664,067

METHOD FOR MACHINING BODIES OF REVOLUTION HAVING A CIRCULAR GENERATRIX

Jean Beauchet, Annecy, France, assignor to Societe Nouvelle de Roulements, Annecy (Haute Savoie), France

Filed Oct. 31, 1969, Ser. No. 872,968
Claims priority, application France, Nov. 6, 1968, 172744
Int. Cl. B24b *1/00*
U.S. Cl. 51—289 R **4 Claims**



This method consists in holding the workpieces in a driving device and imparting two movements of rotation thereto, namely a movement of relative rotation of each workpiece about its axis and a movement of rotation of all the workpieces together with their driving device about the axis of this device which forms a predetermined angle with the axis of the grinding wheel revolving in the opposite direction compared with said device, the workpieces being fed automatically to said driving device, then brought into grinding engagement with the wheel and eventually ejected also automatically upon completion of the continuous machining operation.

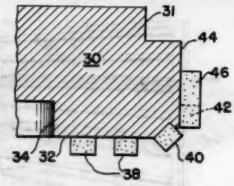
3,664,068

ROTARY GRINDING WHEEL

Leopold H. Metzger, Highland Park, and Harold C. Miller, Chicago, both of Ill., assignors to Super-Cut, Inc., Chicago, Ill.

Original application May 23, 1968, Ser. No. 731,591, now Patent No. 3,550,575, dated Dec. 29, 1970. Divided and this application Apr. 13, 1970, Ser. No. 27,565
Int. Cl. B24d *5/00, 7/00*
U.S. Cl. 51—209 **3 Claims**

A rotary abrasive grinding head adapted progressively to traverse a pre-grooved refractory surface, embodying impact members which fracture the intervening ribs between the grooves and thus remove the fractured fragments, and also



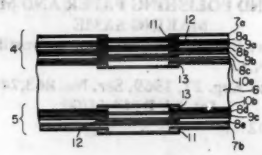
embodying abrasive members which eradicate the residual or remaining portions of the ribs.

3,664,069

PNEUMATIC SHELL STRUCTURES CONSTRUCTED FROM SYNTHETIC RESIN FILMS

Masaru Ikai, Kyoto-shi; Toshikazu Ishii, Otsu-shi, and Michiaki Higashikuze, Takatsuki-shi, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed July 18, 1969, Ser. No. 843,068
Claims priority, application Japan, July 25, 1968, 43/52711; Aug. 1, 1968, 43/54264; Dec. 26, 1968, 43/95110; 43/95111; Jan. 20, 1968, 44/3894
Int. Cl. E04b *1/345*
U.S. Cl. 52—2 **19 Claims**



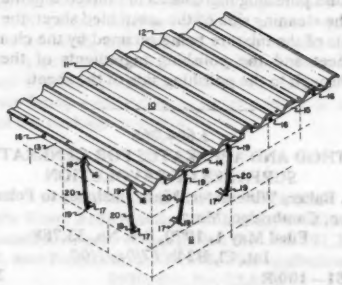
Disclosed herein is a pneumatic shell structure which is constructed from two sheet layers, each composed of a plurality of long rectangular synthetic resin films which are arranged side by side in a manner that longitudinal side edge portions of the films are mutually superimposed. The sheet layers are hermetically sealed about their edges to a support frame, so that the arranged films can uniformly carry the stress created on the sheet layers owing to the inner pressure of the airtight air chamber.

3,664,070

HAY COVERING

Willis W. Golay, Route 1, Kimberly, Idaho

Filed Apr. 9, 1970, Ser. No. 26,991
Int. Cl. E04d *1/34*
U.S. Cl. 52—4 **3 Claims**



A hay covering having a multiplicity of interlockingly engageable canopy portions. Each of the canopy portions is

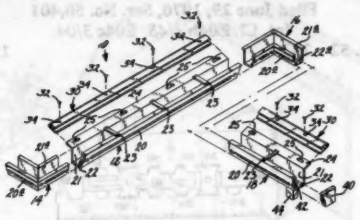
provided with frame portions suitably fastened to each of the canopy portions and distally disposed inwardly from each of the respective terminal ends thereof, each of the frame portions being shorter in length than the respective edges of the canopy. The frame portions are provided with a multiplicity of holes spaced apart at intervals. Retaining pins operable to be driven into bales of hay are provided. S-hooks commonly known are used and employed to engage preselected bales in the frame portions and respective retaining pins driven into bales of hay to fasten canopy portions to stacked bales of hay.

3,664,071

REMOVABLE EAVE GUTTER CONSTRUCTION

William E. Gallagher, 3722 Pleasant Ave., So., Minneapolis, Minn.

Filed Sept. 2, 1970, Ser. No. 69,030
Int. Cl. E04d *13/06*; E02b *9/04*
U.S. Cl. 52—15 **4 Claims**



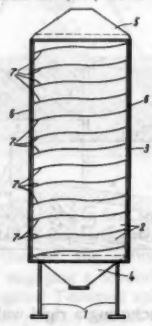
A gutter construction which is readily detachable and reattachable to an eave without necessitating the use of any implement or tool. A generally U-shaped channel is provided having longitudinally-spaced openings in the walls thereof for the reception of nails (or other similar securing devices) extending transversely therethrough for fastening the channel to an eave. A gutter having a flange portion upwardly and outwardly extending from the rear wall thereof and a plurality of longitudinally-spaced, inverted T-shaped slots along the flange portion is secured to the U-shaped channel by insertion of the flange portion into the channel whereby each of the T-shaped slots engages a different one of the securing devices.

3,664,072

VERTICAL CYLINDRICAL SILO WITH WALL OF FLEXIBLE MATERIAL

Werner Lieckfeld, Idstein/Taunus, Germany, assignor to Braun & Lubbe, Hamburg, Germany

Filed Apr. 27, 1970, Ser. No. 32,118
Claims priority, application Germany, Apr. 26, 1969, P 19 21 512.4
Int. Cl. E04h *7/24*; E04b *1/347*
U.S. Cl. 52—63 **21 Claims**



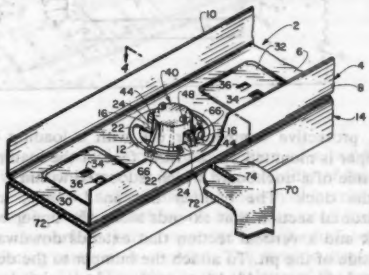
This disclosure teaches a silo having a vertical cylindrical wall of a flexible material, preferably of textile fabric suspended from a supporting frame and preferably engaged sealingly to a rigid lower closure. The flexible material, such as the textile fabric is wound in a spiral band with its lower margin connected to the upper margin of the last preceding turn to form the vertical cylindrical wall of the silo. By this expedient vertical seams are avoided so that weft threads of the textile fabric are substantially spared from tangential hoop stresses. The textile fabric is preferably woven and coated with rubber or plastic.

3,664,073

BUILDING PANEL CONSTRUCTION AND SECUREMENT MEANS THEREFOR

Council A. Tucker, Glendale, Calif., assignor to E. Walter Scott, Los Angeles, Calif.

Filed Nov. 13, 1970, Ser. No. 89,258
Int. Cl. E04b *1/60*
U.S. Cl. 52—127 **18 Claims**



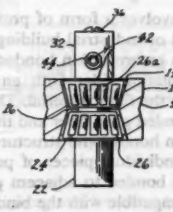
A building panel construction for non-bearing partition walls and the like which are easily assembled and if need be, disassembled after erection and at a later time, wherein panels of identical configuration may be secured to one another in back-to-back relationship by the disposition of a securement member in mating connector holes in each of the panels; wherein the connector member in the preassembled state is inserted into the connector holes and by a simple rotational movement thereof, effects rigid securement of each of the panels to one another. Alignment and positioning means are provided in the panels so as to aid in the securement operation and to lend some stability and rigidity to the assemblage and also disclosed is building construction utilizing panels as hereinbefore disclosed and connector members, all of which have aesthetic quality to blend into modern day architectural decor.

3,664,074

ROLLER ENTRY GUIDE FOR ROD MILL

Robert E. Howard, Kansas City, Kans., assignor to Armco Steel Corporation, Middletown, Ohio

Filed Apr. 10, 1970, Ser. No. 27,203
Int. Cl. B21b *39/20*
U.S. Cl. 72—250 **8 Claims**



An adjustable guide mechanism for directing high speed heated metal rods and the like through a series of cross sec-

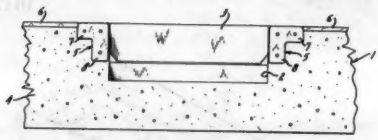
tion reduction stations. The mechanism comprises in part a roller mounted on a pair of tapered circular roller bearing cones which in turn are adjustable mounted on a shaft passing therethrough. By adjusting said bearing cones relative to said roller and said shaft, it is possible to maintain adequate pressure thereon and avoid the development of damaging oscillations.

3,664,075

PROTECTIVE BUMPER

John F. Hazlewood, Milwaukee, and Herbert T. Ruehl, Mequon, both of Wis., assignors to Kelley Company, Inc., Milwaukee, Wis.

Filed Nov. 17, 1969, Ser. No. 877,163
Int. Cl. F16f *1/44*
U.S. Cl. 52—173 **16 Claims**



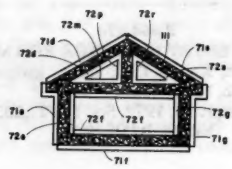
A protective bumper for use with a loading dock. The bumper is mounted on the front face of the loading dock on the side of a dockboard which is located within a pit formed in the dock. The bumper has an L-shape, including a horizontal section that extends along the upper edge of the dock and a vertical section that extends downwardly along the side of the pit. To attach the bumper to the dock, one or more bolts are welded to a curb angle on the dock and the bolts extend within holes formed in the bumper. In the preferred form, the bolts have a generally L-shape with one leg of each bolt being welded flatwise to the curb angle and located within a slot formed in the back surface of the bumper, while the other leg extends outwardly within a hole in the bumper and receives a nut.

3,664,076

RANDOM HONEYCOMB STRUCTURE

Wallace W. McCoy, C/O John E. Wagner 1041 East Green St. Suite 202, Pasadena, Calif.

Filed Mar. 2, 1970, Ser. No. 15,364
Int. Cl. E04c *2/10*
U.S. Cl. 52—264 **4 Claims**



This disclosure involves a form of prefabricated structure such as commercial or industrial buildings, houses or enclosures employing an external skin bonded to an intermediate structural and insulating filler with an inner surface skin similarly bonded to the filler material. The external skins are preferably resin bonded glass fiber and the intermediate filler composes a random honeycomb structure made of cellulosic material, such as individual pieces of paper of random size each rigidified and bonded to adjacent pieces by a resinous binder which is compatible with the binder of the skins. The structure is shown in continuous panels and actually three dimensional structure configurations as well as discrete structural elements which may be used to replace comparable structural elements normally made of wood. Disclosed also are processes for continuous manufacture of structures employing the concept of this invention either in the factory or on site.

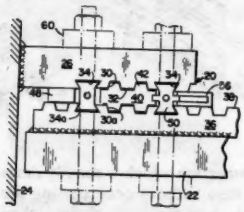
The same basic structure is shown in various configurations. Illustrated are a number of panel sections employing the same structure arrangement but different filler density whereby the load bearing strength of the panel may be controlled and its insulating properties varied as well. Structural strength can also be varied by changing the dimensions and concentrations of resin/fiberglas of either or both external skin surfaces. Disclosed also are individual structural elements produced from waste paper material and resin bonded skins.

3,664,077

CONNECTION JOINT FOR STRUCTURAL MEMBERS

Thomas N. Arnold, Sutter Hotel, 191 Sutter St., San Francisco, Calif.

Filed June 29, 1970, Ser. No. 50,401
Int. Cl. E04b *1/48*; E04c *3/04*
U.S. Cl. 52—283 **12 Claims**



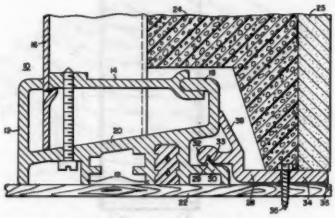
A connection joint for structural frame members capable of withstanding forces of tension, compression, shearing and bearing utilizes transverse slots on portions of the members to be connected which are brought into register so that key members can be installed in the slots. The key members are in groups of basically two types, those which accommodate bearing and shearing and those which accommodate tension or compression forces that are transverse to the applied shearing forces. The connection is shown in different embodiments such as beam or girder connections with a column or end to end connections of beams, rod or cables.

3,664,078

SILL ANCHORING STRUCTURE

Billie C. Merkin, Pittsburgh, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed July 23, 1970, Ser. No. 57,565
Int. Cl. E02d *27/00*
U.S. Cl. 52—293 **6 Claims**



A structure for anchoring a rigid wall structure to a floor or foundation structure, the anchoring structure comprising a truncated raised portion associated with the lower (and/or upper) edge of the wall, and a clip member having a recess

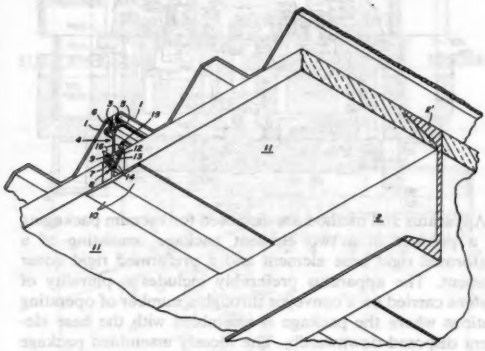
with opposed tapered sides. The recess is dimensioned to receive the truncated portion of the wall with the sides thereof bearing against the tapered sides of the recess when the clip member is securely fastened to the floor. The clip member further includes an upstanding arm located to engage the rigid wall structure at a location above the truncated portion when the recess of the clip member is disposed to engage the truncated portion, and the member is securely fastened to the floor.

3,664,079

INSULATION SUPPORT

John O. Bowser, Natrona Heights, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed June 1, 1970, Ser. No. 42,248
Int. Cl. E04b 1/40
U.S. Cl. 52—479 2 Claims



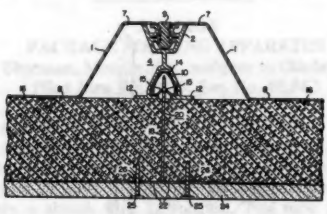
A building structure in which a rib extends inwardly from exterior sheathing and has a T-shaped base on which is supported means for holding an insulation panel in position beneath the sheathing, the said means including a channel-shaped portion in which the said base is positioned.

3,664,080

NAILABLE WALL CONSTRUCTION

James D. Klingensmith, Allegheny Township, Westmoreland County, and George Volinsky, Jr., Pittsburgh, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed July 6, 1970, Ser. No. 52,271
Int. Cl. E04b 1/40
U.S. Cl. 52—479 4 Claims



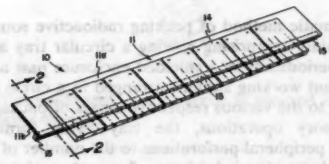
A wall construction including a first rigid panel engaging a first elongated spline extending lengthwise of the panel and facing to one side thereof, the spline having elongated shoulder portions for engaging a second rigid panel on one side thereof. An elongated T-shaped spline is connected to the first spline via a web portion thereof while flange portions of the T-shaped spline engage the side of the second panel opposite to and in alignment with the shoulder portions of the first spline. This combination provides a firm, rigid structure for driving a fastening means through the flange portions of the T-shaped spline for securing a third panel to the second panel via the flange portions.

3,664,081

BLOWBACK SEAL AND GAUGE FOR BUILDING EXTERIOR PANELS

Otis M. Martin, San Jose; John K. Kough, Morgan Hill; Silas M. Miller, Saratoga, and Blair B. Kough, Morgan Hill, all of Calif., assignors to Ditz Crane, San Francisco, Calif.

Filed July 15, 1970, Ser. No. 55,140
Int. Cl. E04d 1/36, 3/362
U.S. Cl. 52—540 18 Claims



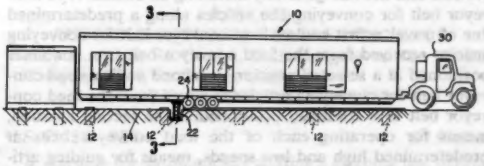
A prefabrication panel for the construction of a building exterior in which one or more layers of a plurality of facing material is secured to a sheathing in a side-by-side relation along the length of the sheathing. A strip is secured to the sheathing on the surface thereof opposite from the surface on which the facing material is secured. The strip is disposed along the length of the sheathing in the vicinity of the lower edge thereof. A plurality of such panels are placed in overlapping relation to form a building exterior. In one embodiment, the strip of the upper panel has a surface for confronting the sheathing of the lower panel for sealing engagement and has another surface confronting the facing material fixed to the lower panel for providing a weather seal. In another embodiment, the strip of the upper pane has a surface perpendicular to the sheathing of the upper panel which surface confronts and is contiguous to the upper edge of the sheathing of the lower panel to serve as a guide for the aligning of overlapping panels and also to form a weather resistant seal.

3,664,082

METHOD OF PLACING A MOBILE HOME ON A FOUNDATION

James F. Zintel, Indianapolis, Ind., assignor to Jenn-Air Corporation, Indianapolis, Ind.

Filed Dec. 15, 1970, Ser. No. 98,325
Int. Cl. E04b 1/343, 1/35
U.S. Cl. 52—742 7 Claims

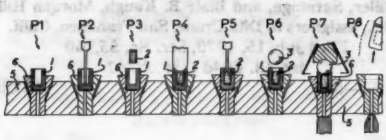


A method of positioning and lowering a mobile home body onto a prepared foundation and pad in semi-permanent location.

3,664,083
METHOD OF AUTOMATICALLY PACKAGING RADIO ACTIVE SOURCES AND APPARATUS THEREFOR

Jean Fradin, 4 bis, rue Blanche, 92 Bois Colombes, and Paul Lengagne, 2, rue de Rouen, 92 Nanterre, both of France

Filed Mar. 5, 1970, Ser. No. 16,780
Claims priority, application France, Mar. 11, 1970, 6906546
Int. Cl. B65b 57/00
U.S. Cl. 53—53 8 Claims

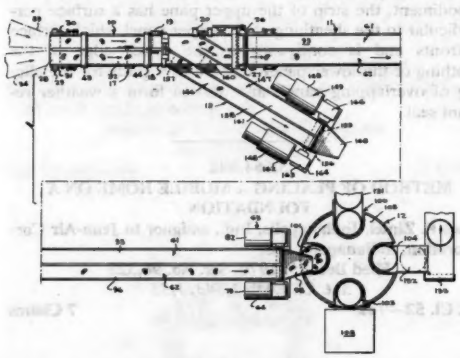


An automatic method of packing radioactive sources, the method mainly comprising moving a circular tray automatically and periodically in a shielded enclosure past a number of equidistant working stations arranged in a circle and corresponding to the various respective stages of packaging and to supervisory operations, the tray being formed with equidistant peripheral perforations to the number of working stations, a logic circuit initiating, for each perforation, the starting or not starting of a working station in dependence upon the result output by the immediately preceding working station.

3,664,084
APPARATUS FOR HANDLING ARTICLES

George E. Meckley, Abbottstown, Pa., assignor to Hanover Guest Quality Foods Corporation, Hanover, Pa.

Filed Nov. 13, 1970, Ser. No. 89,772
Int. Cl. B65b 57/20
U.S. Cl. 53—59 R 35 Claims

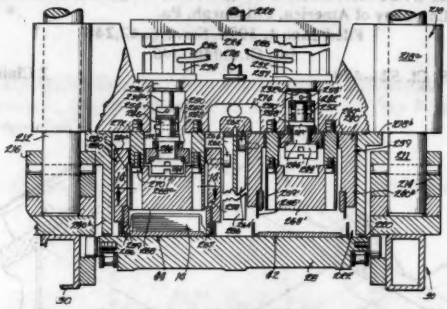


An apparatus suitable for use in packaging articles such as pretzels and the like generally including an endless feed conveyor belt for conveying the articles along a predetermined line of travel, a first endless load conveyor belt for conveying articles received from the feed conveyor belt to a container positioned at a selected position, a second endless load conveyor belt for conveying articles received from the feed conveyor belt to a container positioned at the second location, means for operating each of the load conveyor belts at predetermined high and low speeds, means for guiding articles carried at random by the feed conveyor belt selectively onto the first and second load conveyor belts, and control means operative alternatively to operate one of the feed conveyor belts at the predetermined low speed while the guiding means operates to guide articles from the feed conveyor belt onto the one load conveyor belt and the other load conveyor belt operates at the predetermined high speed whereby the load conveyor belts operate alternatively at high speeds to load groups of the articles into a container positioned at the selected location.

3,664,085
PACKAGING MACHINE

Roy S. Rousseau; Raymond J. Keating, both of Bettendorf, and Gary L. Steinke, Davenport, all of Iowa, assignors to The Kartridge-Pak Co., Davenport, Iowa

Filed Nov. 24, 1969, Ser. No. 879,338
Int. Cl. B65b 31/02
U.S. Cl. 53—112 R 25 Claims

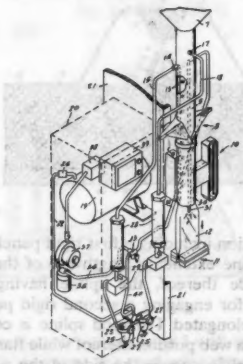


Apparatus and method are disclosed for vacuum packaging of a product in a two element package consisting of a preformed rigid base element and a preformed rigid cover element. The apparatus preferably includes a plurality of platens carried on a conveyor through a number of operating stations where the package is assembled with the base element disposed downwardly. The loosely assembled package is moved into sealing station where a concave housing placed over the package elements forms a vacuum chamber with the platen. The chamber is vacuumized, and an annular sealing member carried within the concavity of the housing moves downwardly to press the peripheral portions of the package elements together while a vacuum is maintained within the chamber.

3,664,086
GAS FLUSHING SYSTEM FOR VERTICAL FORM, FILL AND SEAL MACHINES

Robert C. James; David A. Wilson, and Frank E. Pringle, Jr., all of Sheboygan, Wis., assignors to Hayssen Manufacturing Company, Sheboygan, Wis.

Filed Dec. 29, 1969, Ser. No. 888,615
Int. Cl. B65b 31/04
U.S. Cl. 53—112 A 12 Claims



Gas flushing is effected by introducing the gas through one or more ducts into a free portion of the vertical package

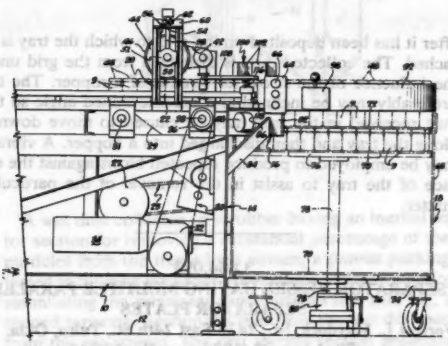
forming, filling and sealing tube above the area to which packaging sheet material is fed onto and tubularly formed about the tube. At least one of the ducts communicates with an extension duct nozzle depending within the tube for releasing and distributing flushing gas onto the product delivered through the tube into the formed packaging bags. Prepurging gas may be introduced into the tube upstream from the flushing gas. Gas sampling and machine start-up preflushing may be effected through a duct having a combination inlet and outlet located to extend partially downwardly into the bag to be filled or which may have been last filled when the machine is restarted after a shut-down.

3,664,087

CONTAINER POSITIONING MACHINE

Wallace W. Choate, and Norman A. Amendola, both of Rochester, N.Y., assignors to Gerber Products Company, Fremont, Mich.

Filed July 15, 1970, Ser. No. 54,921
Int. Cl. B65b *5/10, 35/30*
U.S. Cl. 53—163 **12 Claims**



A machine for placing a multiplicity of upright containers on a container support surface in a side-by-side relationship. A support structure defining a container passageway which has a discharge end communicating with the support surface. The support structure includes means for continuously moving and urging containers toward the passageway. Transport means are provided for moving containers through the passageway onto the support surface. Further means are for temporarily retaining the containers in the passageway to the support structure to enable the replacement of filled support surfaces.

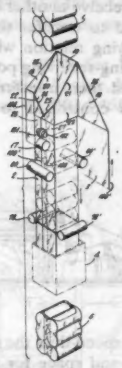
3,664,088

PACKAGE FORMING APPARATUS

Earle C. Sherman, Monroe, La., assignor to Olinkraft, Inc.

Filed June 23, 1970, Ser. No. 48,963
Int. Cl. B65b *9/06*
U.S. Cl. 53—180 **13 Claims**

A packaging machine comprising: a tube forming section; a grouping section; a separating section and a sealing section. In the tube forming section, a tube of packaging material, preferably a shrink film, is formed. The tube then moves downwardly through the remaining sections of the machine. Articles to be packaged within the tube of packaging material are fed to the top of said machine and are allowed to travel downwardly aided by the action of gravity into said tube. With the articles thus positioned within said tube, they are grouped into an arrangement suitable for packaging. The groups thus formed travel downwardly aided by the action of gravity into the separating section and are separated within the tube by a distance sufficient to afford adequate packaging material for tucking at each end of the respective groups. With said material thus tucked at each end, the packaging material is secured in place to thereby form a package. In a preferred embodiment, the material is secured in place by the shrinking thereof.

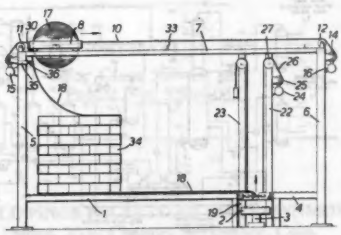


3,664,089

EQUIPMENT FOR FORMING A STACK OF BRICKS OR OTHER ARTICLES AND FOR INTERLEAVING SUCCESSIVE LAYERS WITH THERMOPLASTIC FILM MATERIAL

Dieter Keck, Laggenbeck, Germany, assignor to C. Keller u. Co., Laggenbeck, Germany

Filed Nov. 9, 1970, Ser. No. 87,900
Claims priority, application Germany, Nov. 21, 1969, P 19 58 522.9
Int. Cl. B65b *41/12, 27/02*
U.S. Cl. 53—199 **7 Claims**



Equipment for inserting a thermoplastic film material in zig-zag formation between layers of bricks comprises a roller conveyor for supporting the bricks and a support system for a roll of the film material. Drive motors cooperate to move the roll to and fro so that successive passes lay down a length of film material between each layer of bricks. When a stack is complete an outer covering is wound round the stack.

3,664,090

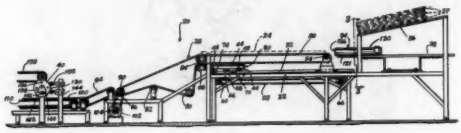
AUTOMATIC STUFFER FOR SLEEPING BAGS

Wesley H. Atkin, St. George, Utah, assignor to The Wenzel Company West, St. George, Utah

Filed July 16, 1970, Ser. No. 55,523
Int. Cl. B65b *5/00, 39/00*
U.S. Cl. 53—258 **17 Claims**

A machine for automatically stuffing a sleeping bag batting into an empty ticking. The machine comprises a reversible carriage which is adapted to receive a cut-to-length batting from a feed conveyor and carry it into an empty ticking with the carriage contacting the closed end of the ticking stretched over a funnel which receives the batting in such a

fashion that the ticking is pulled inside out to cover the batting. After carrying the batting into the ticking, the carriage is reversed to receive another batting length. A stuffing conveyor is designed to transfer the batting from the feed conveyor into overlying relation with the carriage which is elevatable in its batting-receiving position to take the batting off the conveyor and then transfer it into the ticking. The stuffing conveyor is controlled to move the batting at a



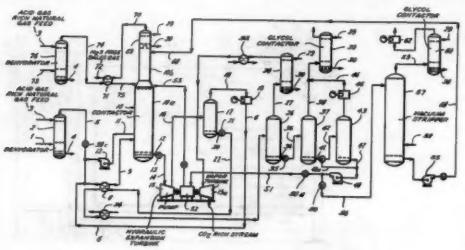
greatly faster rate of speed than the feed conveyor in order to provide ample time and space for working. Special control means comprising a timer disc or wheel is synchronized with the speed of the feed conveyor to operate the carriage and the supplementary stuffing conveyor with means for adjusting the control or timer disc to accommodate different lengths of batting. Limit switch control means are further provided for reversing the carriage and stopping it for the next batting-receiving operation.

3,664,091

PROCESS AND SYSTEM FOR REMOVING ACID GAS FROM NATURAL GAS

Arnold M. Hegwer, Houston, Tex., assignor to Fish Engineering & Construction, Inc., Houston, Tex.

Filed June 27, 1969, Ser. No. 837,106
Int. Cl. F25j *3/00*
U.S. Cl. 55—29 **8 Claims**



A process and system for removing acid gas such as CO_2, H_2S, RSH and COS from a natural gas stream by physical absorption using a solvent which will absorb acid gas. The method and system is arranged such that the acid gas is removed from the natural gas without the aid of external refrigeration and with substantially no external heat.

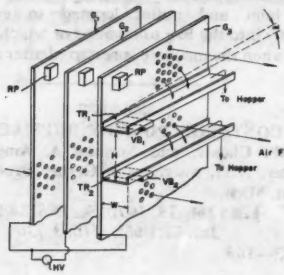
3,664,092

COLLECTING APPARATUS FOR ELECTROSTATIC PRECIPITATORS

James Henry Vincent, Plainfield, N.J., assignor to American Standard Inc., New York, N.Y.

Filed Aug. 24, 1970, Ser. No. 66,328
Int. Cl. B03c *3/76*
U.S. Cl. 55—112 **6 Claims**

Covers an electrostatic precipitator and mechanism associated therewith for collecting dust, dirt and other particulate matter received by the electrostatic precipitator. The electrostatic precipitator may include two or more apertured plates or grids which are vertically oriented and positioned parallel to each other and arranged so that air or gas laden with the particulate matter will traverse the apertures. The alternate grids may be connected to one terminal of a high voltage source while the other or adjacent alternate grids may be connected to the other terminal of the same source of voltage and grounded. The last grid, i.e., the downstream grid of the series, may be equipped with a tray for receiving the collected dust. The collected dust will reach the tray only



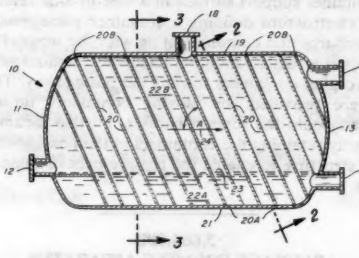
after it has been deposited on the grid to which the tray is attached. The collected dust is dislodged from the grid under the influence of the stroke or strokes of a rapper. The tray preferably may be inclined at a predetermined angle so that dust received in the tray may be caused to move downhill along the tray and then discharged into a hopper. A vibrator may be employed to produce repeated blows against the surface of the tray to assist in the removal of the particulate matter.

3,664,093

SEPARATOR VESSEL HAVING MULTIPLE PARALLEL SEPARATOR PLATES

Forrest L. Murdock, Sr., 2420 East 24th St., Tulsa, Okla.

Filed Apr. 22, 1970, Ser. No. 30,843
Int. Cl. B01d *19/00*
U.S. Cl. 55—174 **6 Claims**



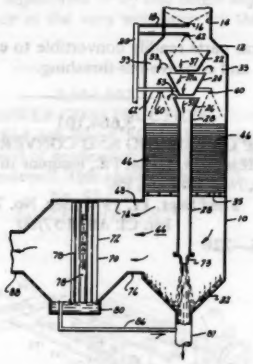
This invention relates to a means for separating solids from fluid or gas, fluids from gas, and commingled immiscible fluids from each other when one portion of such fluids has a heavier specific gravity than the other. When used to separate commingled immiscible fluids the invention includes a vessel having a fluid inlet, a light fluid outlet and a heavy fluid outlet, the outlets being spaced from the inlet, and a plurality of spaced apart parallel separator screens positioned within the vessel between the inlet and the outlet arranged such that fluid flowing from the inlet to the outlet passes through the separator screens, each separator screen being a planar foraminous reticulum of integrally formed relatively small width and small thickness strands, all of which are longitudinally downwardly inclined providing a multiplicity of continuous uninterrupted downwardly inclined paths on which coalesced droplets of heavier fluid may travel towards the bottom of the vessel.

3,664,094

FLOW BALANCING RESTRICTION IN GAS SCRUBBER

William E. Barkovitz, Lincoln Park, and Julius V. Przygocki, Trenton, both of Mich., assignors to American Standard Inc., New York, N.Y.

Filed July 27, 1970, Ser. No. 58,485
Int. Cl. B01d 45/00
U.S. Cl. 55—223 9 Claims



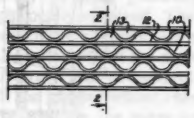
A wet dust collector or scrubber having an inertial separator section for removing a substantial percentage of the dust particles from the treated gas stream, a porous packing subjected to flushing liquid for producing a concentrated fog and assimilating the remaining dust particles into said fog, and a second separator section for removing the wet dust particles from the gas stream. The first inertial section preferably includes a special flow-limiting nozzle which exerts a balancing pressure drop on the flow of separated dust particles so that proper particle separator flows are achieved in the first inertial section.

3,664,095

EXCHANGE PACKING ELEMENT

Gunnar C. F. Asker, and Maurice A. Hubscher, both of 18 Industrial Drive, Trenton, N.J.

Filed Oct. 21, 1968, Ser. No. 768,995
Int. Cl. B01d 53/02
U.S. Cl. 55—387 13 Claims



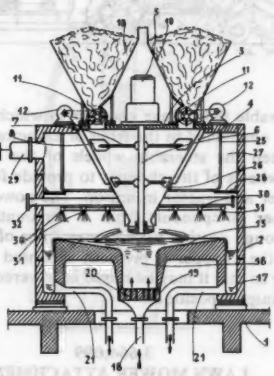
A packing for fluid treatment, either gaseous or liquid, for various surface contact effects such as drying of the fluid, heat exchange, ion exchange, molecular sieve separations and the like, wherein a laminated cellular structure of paper is coated throughout the cellular structure with a hard resin such as an epoxy resin in which such resin coating can be used alone for heat exchange purposes, or it can be further coated with dry solids to effect many of the fluid modifications.

3,664,096

PROCESS AND APPARATUS FOR SUSPENDING PARTICLES IN A LIQUID

Pierre LeJeune, Grenoble, France, assignor to Neyrpic-BMB, Grenoble, France

Filed Mar. 3, 1970, Ser. No. 16,015
Claims priority, application France, Mar. 7, 1969, 6906506
Int. Cl. B01d 46/00
U.S. Cl. 55—466 5 Claims



Particles to be suspended in a liquid are fed into an enclosure maintained at less than atmospheric pressure. In the enclosure the particles are subjected to mixing and then centrifuging to assist the vacuum in removal of air from the particles. The particles leaving the centrifuge are subjected to liquid jets to assist in removal of air and the particles then fall onto a layer of the suspending liquid and thereafter in homogeneous suspension in the liquid leave the enclosure.

ERRATUM

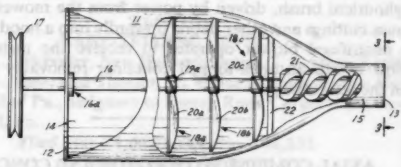
For Class 56—10 see:
Patent No. 3,664,057

3,664,097

GRASS-CLIPPINGS PELLETIZER FOR LAWNMOWERS

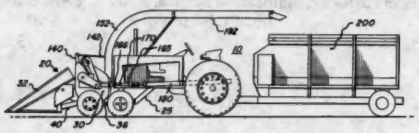
Richard A. Pedigo, 2030 Champa St., Denver, Colo.

Filed Dec. 17, 1970, Ser. No. 99,151
Int. Cl. A01d 43/00
U.S. Cl. 56—1 6 Claims



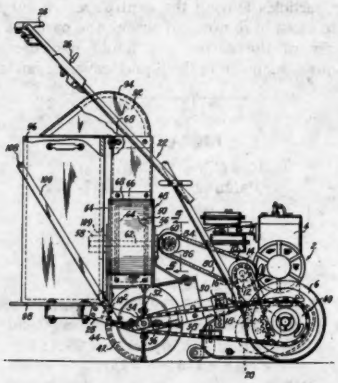
Attachment for power lawnmowers, driven by the lawnmower motor has a rotating shaft revolving fan blades and a screw auger within a hollow body. Grass clippings from the mower are sucked into an inlet in the body by the fan blades, compacted by the auger, and emitted through an apertured extrusion plate as dense pellets.

3,664,098
REMOVABLE SILAGE CHOPPER
Charles C. Thor, Box 554, Hutchinson, Minn.
Filed Apr. 26, 1971, Ser. No. 137,513
Int. Cl. A01d *45/02*
U.S. Cl. 56—13.9 **11 Claims**



A removable field silage chopper in which the chopper is removably connected to the front of a tractor with a steering link between the steerable wheels of the tractor and the steerable wheels of the chopper to provide for movement of the chopper and tractor in unison. The power is supplied to the chopper components from a demountable shaft connected through gearing to the power take-off of the tractor. Similarly, the chopper is pivotally mounted on the front of the tractor so that it may be raised or lowered between working and transport positions.

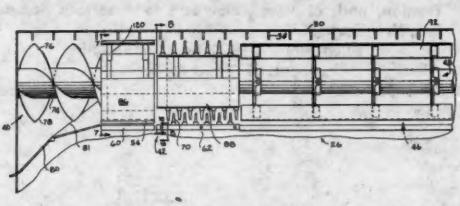
3,664,099
LAWN MOWER ATTACHMENT
Joseph Henry Chouinard, 34 Broad St., East Hartford, Conn.
Filed Oct. 12, 1970, Ser. No. 79,806
Int. Cl. A01d *35/22*
U.S. Cl. 56—13.3 **5 Claims**



A wheel supported attachment for a self-powered lawn mower is attached in trailing relation to the mower and a cylindrical brush, driven by power from the mower, sweeps grass cuttings and other debris upwardly into a hood in which a centrifugal blower operates to receive the material and blow it into an open-topped container removably mounted on the attachment.

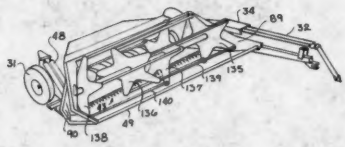
3,664,100
AXIAL COMBINE WITH ROTOR AND CONCAVE CONVERTIBLE TO SUPPORT DIFFERENT THRESHING ELEMENTS
Edward William Rowland-Hill, Lancaster, Pa., assignor to Sperry Rand Corporation, New Holland, Pa.
Filed June 30, 1970, Ser. No. 51,304
Int. Cl. A01d *41/02*
U.S. Cl. 56—14.6 **10 Claims**

The threshing and separating sections of an axial flow combine have the rotors and concaves in front and rear parts



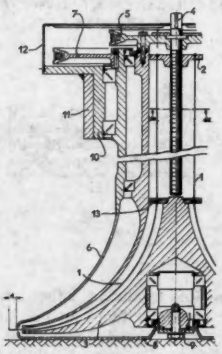
with the rear parts readily convertible to either spike threshing or rasp and concave-bar threshing.

3,664,101
CROP GATHERING AND CONVERGING REEL
Joseph C. Hurlburt, Leola, Pa., assignor to Sperry Rand Corporation, New Holland, Pa.
Filed Sept. 11, 1970, Ser. No. 71,551
Int. Cl. A01d *57/00*
U.S. Cl. 56—220 **21 Claims**



A crop gathering and converging reel has two reel sections rotatably mounted on a transverse stationary tube with adjacent ends of the reel sections overlapping. The two reel sections have opposite angularities to sweep cut crop rearwardly into the header and laterally towards the center for converging the cut crop to a narrower discharge.

3,664,102
CUTTER MECHANISM FOR AGRICULTURAL MACHINES OR LAWN MOWERS
Walter Reber, 50, avenue du Morechal Foch, Saverne, France
Filed May 11, 1970, Ser. No. 36,184
Claims priority, application France, May 14, 1969, 6914884
Int. Cl. A01d *55/18*
U.S. Cl. 56—295 **6 Claims**



The disclosure is of a cutter mechanism for lawn mowers or for agricultural machines serving solely or partially for mowing which can be drawn by any motor vehicle to which

they can be adapted, or can be self-propelled, which is characterized in that the elements intended to cut are solid or hollow wires or bands which can be of any form, profile and constitution, which wires or bands are mounted on fast-rotating supports, and in that the operative lengths of the assembly of wires or bands mounted on one and the same rotating support can be modified, preferably simultaneously by one single adjustment or even if necessary by two or at the very maximum by three adjustments, and in that the assembly of wires or bands mounted on one and the same rotating support can be locked again in the desired position, preferably without adjustment or by one single adjustment, if necessary by two or at the very maximum by three adjustments.

3,664,103

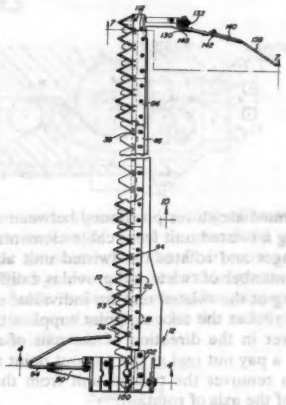
MOWER CONSTRUCTION

Waldo D. McNair, 514 Ash Street, Myrtle Point, Oreg.

Continuation-in-part of application Ser. No. 807,738, Mar. 17, 1969, now abandoned. This application July 1, 1970, Ser. No. 51,636

Int. Cl. A01d *55/02*

U.S. Cl. 56—298 **8 Claims**



A mower bar construction including a toothed elongated stationary support bar and an elongated toothed mounting bar guidingly supported from the support bar for longitudinal reciprocation relative thereto. The teeth on the support bar overlie the teeth on the mounting bar and the latter includes an elongated upwardly opening guideway in which the mounting bar is reciprocally received. The support bar includes structure by which the effective width of the guideway may be varied and the outer end of the mower bar construction includes a rearwardly and downwardly inclined outer shoe for contact with the ground whose rear end may be adjusted in elevation. In addition the outer end of the mower bar construction includes an upstanding rearwardly projecting and inwardly inclined swath plate constructed of stiff but resilient material and provided with a rearwardly and upwardly inclined resilient swath strake or stick that is also slightly inwardly inclined at its rear end. Further, the corresponding base and head ends of the support and mounting bars are provided with coacting guide surfaces including a shallow longitudinal recess formed in the support bar in which the head end of the mounting bar is captively retained for longitudinal reciprocation and the recess includes a bottom longitudinal groove or channel in which a depending rib carried by the head end of the mounting bar is reciprocally received.

3,664,104

FRUITS AND NUTS PICKING DEVICE

Khosrow Jamshidi, 124-4th Avenue, N. W., Faribault, Minn.

Filed Mar. 24, 1971, Ser. No. 127,529

Int. Cl. A01g *19/08*

U.S. Cl. 56—332 **5 Claims**

Apparatus for harvesting fruits from trees comprising first conduit means, coupling means adjacent a first end thereof and adapted for attachment to a source of vacuum. Throat means including inner and outer sleeve members are provided, the inner sleeve member having a fruit receiving opening at one end thereof, a generally flexible fruit receiving portion arranged inwardly of said fruit receiving opening and having an inwardly converging conical portion. The inwardly converging conical portion is arranged to have a minimum diameter which is not substantially greater than the diameter of the fruit being harvested. A generally rigid cylinder depends from the inwardly converging conical portion and is coupled to the inwardly converging conical portion at one end thereof. Aspirating openings are formed along the rigid cylinder adjacent the inwardly converging conical portion, and a second generally flexible sleeve or conical member is coupled to the rigid cylinder at the end opposite from the fruit receiving opening. This second flexible member is arranged to form a generally flexible closure in response to vacuum being applied through said aspirating openings. The outer sleeve is sealingly secured to the inner sleeve about axially spaced points disposed on opposite sides of said aspirating openings, and means defining a port are arranged on the wall of the outer sleeve with means for coupling said port to said first conduit means.

3,664,105

RAKE-TEDDING DEVICE

Thomas L. Stiefvater, New Holland; James G. Greiner, Leola; John K. Hale, and Thomas W. Waldrop, both of New Holland, all of Pa., assignors to Sperry Rand Corporation, New Holland, Pa.

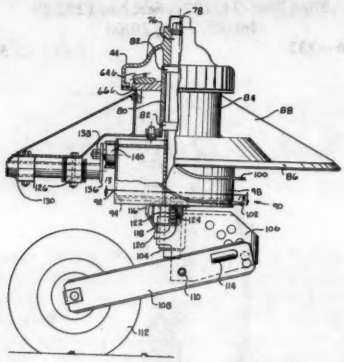
Filed May 24, 1971, Ser. No. 146,231

Int. Cl. A01d *79/00*

U.S. Cl. 56—370 **6 Claims**

A double rotor cam actuated rake-tedding device in which each rotor includes a cam disposed around a cylindrical housing. Each cylindrical housing is rotatively mounted about a vertical axis and is normally held stationary with respect thereto by a locking pin which is spring biased to extend up through one of a series of apertures formed within a bottom floor portion of the cylindrical housing, the series of apertures being particularly spaced such that the cam as-

sociated therewith may be rotatively adjusted for raking or tedding. Further provided is a two speed input drive means



for selectively rotating the double rotors at a high and a low speed for tedding and raking respectively.

3,664,106

MANIPULATING WHEEL FOR A HAY OR CROP COLLECTING TURNING OR TREATING MACHINE

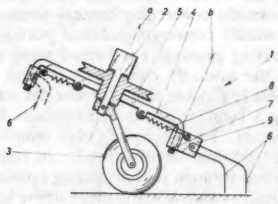
Josef Maugg, Glarus, Switzerland, assignor to Maschinenfabrik Fahr A.G., Gottmadingen, Germany

Filed Aug. 11, 1969, Ser. No. 848,879

Claims priority, application Germany, Aug. 13, 1968, P 17 82 308.4; June 9, 1969, P 19 29 104.4

Int. Cl. A01d *79/00*

U.S. Cl. 56—370 **25 Claims**



In a hay manipulating machine, a manipulating wheel supported from the ground by a support wheel and rotatable about an axis, operating prong means having a rest and an operating position being coupled to the manipulating wheel in a manner that they assume the rest position when the manipulating wheel is in rest position and they assume the operating position when the manipulating wheel is rotated about its axis.

3,664,107

RAKE TOOTH MOUNTING

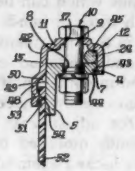
Arthur H. Keller, Western Springs, Ill., assignor to International Harvester Company, Chicago, Ill.

Continuation-in-part of application Ser. No. 862,853, Oct. 1, 1969, now abandoned. This application Mar. 9, 1971, Ser. No. 122,405

Int. Cl. A01d *77/00*

U.S. Cl. 56—400 **14 Claims**

In a wheel rake, a mounting for a rake tooth structure on the wheel which also serves to secure a wheel shield to the wheel comprising a clip having a tooth mounting portion positionable on the periphery of the wheel and an inwardly extending flange with a projection thereon functioning to in-



dent the fiberboard shield as the clip is drawn up against the rim of the wheel by a securing bolt.

3,664,108

INTERMEDIATE STORER FOR APPARATUS FOR STRANDING A TWISTED UNIT OF A CABLE

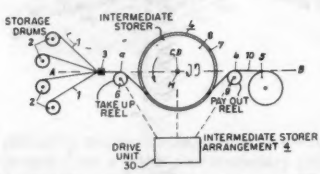
Alfred Strelow, and Klaus Hascher, both of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed July 22, 1969, Ser. No. 843,664

Claims priority, application Austria, July 23, 1968, A 7117/68; A 7118/68

Int. Cl. H01b *13/04*

U.S. Cl. 57—34 AT **4 Claims**



An intermediate storer positioned between a take up point for forming a twisted unit from cable elements and a pay out point engages and rotates the twisted unit about an axis of rotation a number of twists and provides a different direction of stranding of the twisted unit for individual section lengths. A take up reel at the take up point supplies the twisted unit to the storer in the direction of the axis of rotation of the storer and a pay out reel at the pay out point and on the axis of rotation removes the twisted unit from the storer in the direction of the axis of rotation.

3,664,109

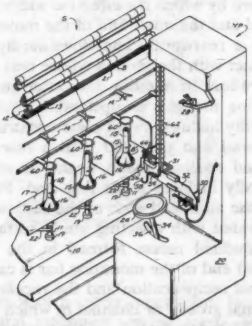
METHOD AND MEANS FOR YARN RETRIEVAL

Roberto Escursell-Prat, Rda. General Mitre, 105 4.°,1.°, Barcelona 6, Spain

Filed Sept. 24, 1969, Ser. No. 860,501

Int. Cl. D01h *15/00*

U.S. Cl. 57—34 R **38 Claims**



In the automatic servicing of an end-down condition at a

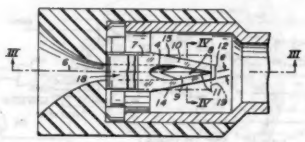
delivery of a textile spinning frame or the like, wherein yarn is sucked from the bobbin and thereafter traveler-threaded and joined with yarn issuing from the frame's delivery rolls, satisfactory suction-retrieval of the bobbin yarn is facilitated by elevating and relatively slowly rotating the bobbin in an unwinding direction, by directing an air blast upwardly through the spinning ring along the surface of the bobbin yarn, and by beating such surface. Excessive twist-loss within the yarn withdrawn from the bobbin after its free end has been retrieved is minimized by rotating the bobbin relatively rapidly in an unwinding direction during such withdrawal. The bobbin is elevated and rotated without being unseated from its spindle. A beater effectively frees the end of the bobbin yarn without deteriorating the same, and, in one embodiment, frees itself of any entanglement which might inadvertently occur.

3,664,110

SLIDING RADIALLY-CLAMPING GRIPPER

Herbert Stalder, Geneva, and Jean Pellaton, Chatelaine/Geneva, both of Switzerland, assignors to Electrospin Corporation, Columbus, Ohio

Filed Mar. 30, 1971, Ser. No. 129,491
Claims priority, application Switzerland, Apr. 3, 1970, 4945/70
Int. Cl. D01h *1/12, 7/92*
U.S. Cl. 57—77.3 **11 Claims**



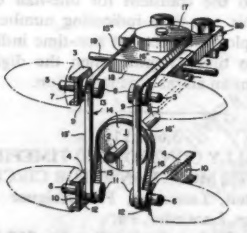
A gripper for use in open-end spinning of textile fiber in which axial movement of fiber is permitted through a bevelled tubular element while the fiber moves through a generally V-shaped groove and has an axial pressure exerted against it by suitable resilient means. The gripper is rotated while the fiber is moved axially under the radial pressure so that a textile yarn is formed.

3,664,111

MULTI-SPINDLE DRIVE MEANS FOR SPINNING AND TWISTING MACHINES

Klaus Weber, and Fritz Urbahn, both of Remscheid, Germany, assignors to Barmag Barmer Maschinenfabrik Aktiengesellschaft, Wuppertal, Germany

Filed June 11, 1970, Ser. No. 45,431
Claims priority, application Germany, June 13, 1969, P 19 30 208.0
Int. Cl. D01h *1/24*
U.S. Cl. 57—105 **6 Claims**



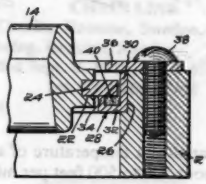
Multi-spindle, band or belt drive for spinning and twisting machines with the drive pulley located conveniently for quick belt changes. The belt runs in a saddle-like fashion around the drive pulley, arcuately about several spindle whorls, and about deflection and/or tensioning pulleys.

3,664,112

ROTATING SPINNING RING

Anthony Netti, Methuen, Mass., and Douglas Bussiere, Plaistow, N.H., assignors to Davis & Furber Machine Company, North Andover, Mass.

Filed Aug. 11, 1970, Ser. No. 62,851
Int. Cl. D01h *7/56, 7/62*
U.S. Cl. 57—120 **11 Claims**



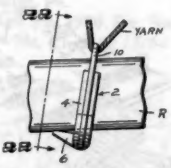
A rotatable spinning ring whose rotation is induced by the friction of the rotating traveler thereagainst during the spinning operation with the ring having a circular bearing portion made of non-metallic bearing material which slidably rotates on a circular metallic bearing surface. The non-metallic bearing material acts as an insulator to prevent effectively the transfer of heat generated at the sliding bearing surfaces to the ring.

3,664,113

TRAVELER WITH MEANS FOR LIMITING FRICTION AND TILTING

Andrew J. Wayson, Needham, Mass., assignor to Merriman, Inc., Hingham, Mass.

Filed Jan. 14, 1970, Ser. No. 2,913
Int. Cl. D01h *7/52, 7/60*
U.S. Cl. 57—125 **21 Claims**



Travelers for use on a vertical or horizontal type spinning or twisting ring having integral rearward extensions that utilize the air velocity acting thereagainst to minimize the frictional engagement of the traveler with ring and to reduce the angle of tilt of the traveler during operation so that the upper part of the traveler does not come into contact with the top of the ring.

3,664,114

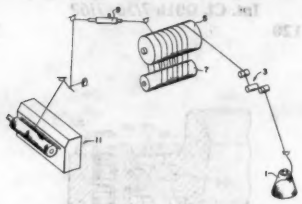
SPUN POLYESTER STRANDS AND METHOD FOR MAKING

Robert L. Ammons, and Robert B. Moore, Jr., both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed July 31, 1969, Ser. No. 846,419
Int. Cl. D02g *3/02*
U.S. Cl. 57—140 R **10 Claims**

Novel spun polyethylene terephthalate strands of improved percent elongation at break and initial modulus are obtained by (1) passing the strand under tension through a jet gas stream such as steam at a rate and gas temperature that effects fusion to the degree that the pulse propagation of the treated strand over a strand distance of 60 centimeters while

under 20 grams tension is reduced to less than 300 microseconds or (2) passing the spun strand under tension



around a roll heated to a temperature of about 175° to 195° C. at a rate of about 300 to 500 feet per minute.

3,664,115

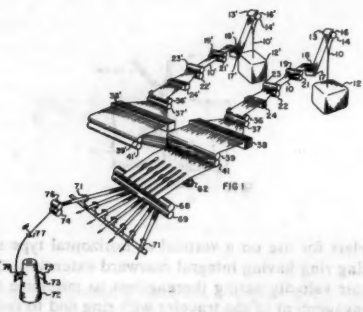
METHOD OF MAKING A SEMI-CONTINUOUS FILAMENT COMBINATION YARN

George A. Watson, Davidson, N.C., assignor to Celanese Corporation, New York, N.Y.

Continuation-in-part of application Ser. No. 606,982, Jan. 3, 1967, now abandoned , and a continuation-in-part of 763,468, Aug. 5, 1968, now Patent No. 3,504,489, which is a division of application Ser. No. 650,795, July 3, 1967, now Patent No. 3,417,560, which is a continuation-in-part of application Ser. No. 382,263, July 13, 1964, now abandoned. This application Apr. 6, 1970, Ser. No. 25,675. The portion of the term of the patent subsequent to Dec. 24, 1985, has been disclaimed.

Int. Cl. D02g *1/00*

U.S. Cl. 57—156 **10 Claims**



A method, apparatus and product comprising producing a semi-continuous filament yarn having staple yarn characteristics from crimped tow comprising longitudinally slitting a deregistered tow comprising different fibers into strips of filaments either with or without a tow spreading stage and subsequently twisting the strips into yarn. The tows differ from each other in the fibers they contain, but each individual tow may contain a relatively uniform blend of different fibers.

3,664,116

DIGITAL CLOCK CONTROLLED BY VOLTAGE LEVEL OF CLOCK REFERENCE SIGNAL

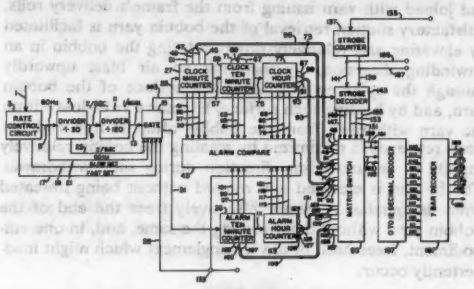
Paul Gene Emerson; Hans Jurgen Thamhain, both of Liverpool, and Bruce Cromwell McIntosh, Utica, all of N.Y., assignors to General Electric Company

Filed Apr. 6, 1970, Ser. No. 25,930

Int. Cl. G04c *3/00, 21/04;* G04b *19/30*

U.S. Cl. 58—23 **15 Claims**

A digital clock circuit particularly suited for monolithic integration wherein the counting rate of the clock is variable from a normal to a faster rate in response to the level of a 60



Hz voltage derived from the power line and applied to a single input terminal as a clock reference signal.

3,664,117

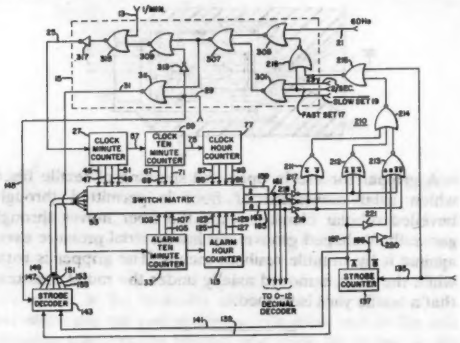
NON-TIME INDICATING NUMBER CORRECTION CIRCUIT

Bruce C. McIntosh, Utica, N.Y., assignor to General Electric Company

Filed June 5, 1970, Ser. No. 43,786

Int. Cl. G04c *9/02*

U.S. Cl. 58—35 W **6 Claims**



When power is applied to a digital clock, the counters therein can assume forbidden states and non-time indicating numbers are generated. This problem is eliminated by a gate circuit responsive to each such non-time indicating number to apply a high frequency signal source to the counter to advance the counter to a time indicating number. Because non-time indicating numbers can also occur on a transient basis, the gate circuit also includes a time delay to avoid response to such transients. The time delay may be provided by a second signal synchronized with the source of transient generation and gated with the strobe signal in a phase to block response to the transient for one-half cycle of the second signal. This non-time indicating number correction circuit is also employed to correct non-time indicating numbers in the alarm time counter when the digital clock is switched to present an alarm time indication.

3,664,118

ELECTRONICALLY CONTROLLED TIMEPIECE USING LOW POWER MOS TRANSISTOR CIRCUITRY

Richard S. Walton, Lancaster, Pa., assignor to Hamilton Watch Company, Lancaster, Pa.

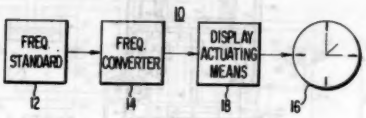
Continuation-in-part of application Ser. No. 768,076, Oct. 16, 1968, now Patent No. 3,560,998. This application Sept. 9, 1970, Ser. No. 70,787. The portion of the term of the patent subsequent to Feb. 2, 1988, has been disclaimed.

Int. Cl. B04c *3/00;* G04b *19/30*

U.S. Cl. 58—50 R **25 Claims**

Disclosed is an electronically controlled timepiece suitable

for use as a wristwatch. A novel solid state electronic oscillator operating at a frequency substantially in excess of the desired timekeeping rate is connected to a divider in the form of a chain of integrated circuit transistor stages formed



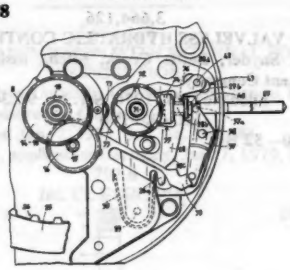
of complementary MOS devices. The divider may be formed from static counters or a combination of dynamic and static counters. Connected to the output of the divider is a display actuator and timekeeping display.

3,664,119

CALENDAR ELECTRIC TIMEPIECE

Rene Besson, Neuchatel, Switzerland, assignor to Ebauches S. A., Neuchatel, Switzerland

Filed July 30, 1969, Ser. No. 846,056
Claims priority, application Switzerland, Aug. 30, 1968, 13111/68
Int. Cl. G04b *19/24*
U.S. Cl. 58—58 **1 Claim**



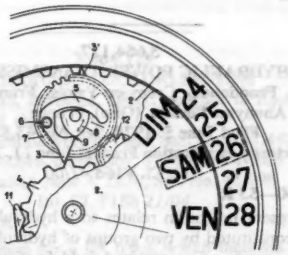
The present invention relates to a calendar electric timepiece.

3,664,120

DRIVE MECHANISM FOR AN INDICATOR OF THE DATE OR THE DAYS OF THE WEEK

Jean-Pierre Golay, and Bernard Gerber, both of Tramelan, Switzerland, assignors to Record Watch Co., S.A., Tramelan, Switzerland

Filed Sept. 21, 1970, Ser. No. 74,071
Claims priority, application Switzerland, Sept. 23, 1969, 14,336/69
Int. Cl. G04b *19/24*
U.S. Cl. 58—58 **11 Claims**



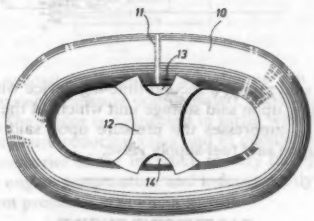
A driving mechanism for a date-or-day indicator comprises a gear driven at the rate of n revolutions daily and carrying a pivotal lever adapted for meshing with a drive gear secured to the indicator. The lever is moved by a cam coaxial with the drive gear and located in the same plane of the lever and revolving at the rate of $(n+1)$ revolutions daily in the same direction as the driven gear so that a nose of the cam causes the lever to enter once every 24 hours into the path of the drive gear to advance the indicator.

3,664,121

CHAIN LINK

Carl-Henning Camitz, Ramnas, Sweden, assignor to Ramnas Bruks Aktiebolag, Ramnas, Sweden

Filed Sept. 8, 1970, Ser. No. 70,065
Int. Cl. F16g *13/06*
U.S. Cl. 59—84 **2 Claims**



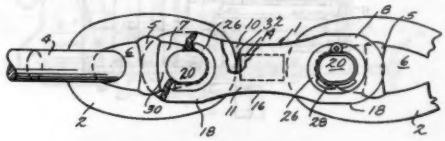
A chain link having a central stud between the sides of the link and a weld at least in one side. The stud is provided with a notch at least in the end facing the weld shaped so that the weld is visible also at the inside of the link. The stud is symmetrical and has notches at both ends.

3,664,122

CHAIN CONNECTING LINK

Charles D. Linnenbank, Wyncroft, Media, Pa., assignor to Baldt Anchor and Chain Corporation-a subsidiary of Baldt Corporation, Chester, Pa.

Filed Apr. 13, 1970, Ser. No. 27,764
Int. Cl. F16g *15/04*
U.S. Cl. 59—85 **6 Claims**



A special link for use in detachably connecting links of chain and other objects to stud-link marine anchor chains. Said connecting link having a positioning member which limits the movement of said stud-link chain with respect to said connecting link so that said connecting link is prevented from damaging, weakening or dislodging the studs in said stud-link chain.

3,664,123

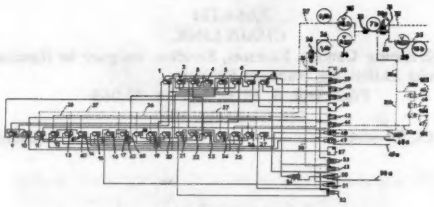
PNEUMATIC LOGICAL RELAYS SYSTEM FOR REMOTE-CONTROLLING AND MONITORING A THERMAL ENGINE

Marc Edouard Zucca, and Jean-Paul Filippi, both of La Ciotat, France, assignors to Chantiers Navals de la Cistat, La Ciotat (Bouches-du-Rhone), France, by said Zucca, a part interest

Continuation-in-part of application Ser. No. 666,052, Sept. 7, 1967, now abandoned. This application July 2, 1969, Ser. No. 3,590
Int. Cl. F01b *27/04, 29/04*
U.S. Cl. 60—16 **13 Claims**

Device for operating an air-starting engine comprising a

first control means which receives starting trigger pulses and supplies a storage unit actuating a pre-lubrication pump and a fuel-supply valve, a first time-lag device with a transit time t_1, which at the end of the time t_1, opens a starting-air valve



and closes said pump, a second time-lag device with a transit time t_2, acting upon said storage unit which, at the end of the time $t_1 + t_2$, suppresses the pressure upon said starting-air valve and upon said fuel-supply valve.

3,664,124

GAS TURBINE ENGINE

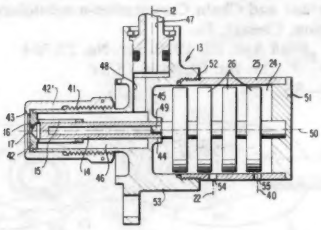
Adolf Fehler, Puchheim, Germany, assignor to Motoren-und Turbinen-Union Muchen GmbH, Postfach, Munchen, Germany

Filed Apr. 17, 1970, Ser. No. 29,479

Claims priority, application Germany, Apr. 17, 1969, P 19 19 488.8

Int. Cl. F02c *9/08*

U.S. Cl. 60—39.28 **27 Claims**



A gas turbine engine with a compressor, a combustion chamber and a turbine, in which the fuel metering device, controlling metering slots, is combined with the injection installation so as to form an integral component thereof, for example, within a common housing.

3,664,125

OFFSHORE POWER CONVERSION APPARATUS

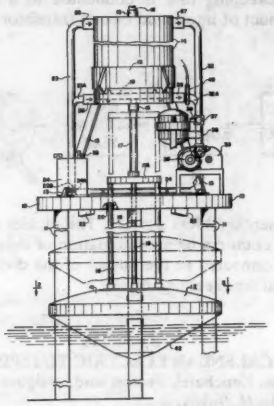
Edward A. Strange, P.O. Box 205, Florence, Oreg.

Filed Mar. 30, 1970, Ser. No. 23,792

Int. Cl. B63h *19/02;* **F04b** *17/00*

U.S. Cl. 60—51 **1 Claim**

An apparatus located in a body of water which has a fluctuating water level for actuation of a float assembly which is coupled to fluid displacement means. Fluid is pumped to a motor during both upward and downward movement of the float assembly with said assembly being retained against lateral movement by ground engaging supports. The motor is



coupled to power conversion means, as for example a generator as shown.

3,664,126

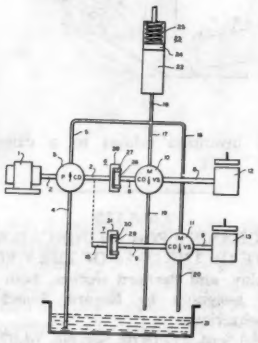
VALVELESS HYDRAULIC CONTROL

James H. Snyder, Battle Creek, Mich., assignor to Clark Equipment Company

Filed Nov. 27, 1970, Ser. No. 93,349

Int. Cl. F15b *15/18*

U.S. Cl. 60—52 HD **10 Claims**



A valveless control apparatus for hydraulic equipment having a pump and two hydraulic motors all of equal capacity in which the selective braking of the motors controls the flow of fluid to and from the hydraulic equipment without the use of any valves.

3,664,127

HYDRAULIC POWER TRANSMISSIONS

Pierre A. Praddaude, Crepy-en-Valois, France, assignor to Societe Anonyme Poclain, (Oise), France

Filed June 5, 1970, Ser. No. 43,831

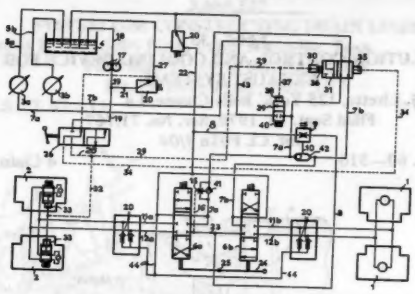
Claims priority, application France, June 11, 1969, 6919398

Int. Cl. F16d *41/00*

U.S. Cl. 60—53 R **3 Claims**

The present invention relates to a hydraulic power transmission constituted by two groups of hydraulic motors by at least one source of pressurized fluid feeding the motors of the first group, while, concomitantly, the motors of the second group are driven by their shaft, and by a first speed

limiter arranged on the delivery conduit of the first group of motors, wherein the motors of the second group having a "-free wheel" function and being connected to ensure this function, a conduit connects the delivery of the first group of



motors to the feed of the second group of motors and is connected upstream of the first speed limiter, while a second speed limiter is arranged downstream of the point of connection of the conduit, in the irrigation circuit of the motors of the second group.

3,664,128

POWER TRANSMISSION WITH INTERNAL POWER DISTRIBUTION

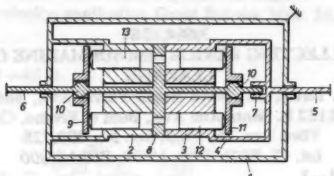
Walter Heyl, Klein Umstadt, Germany, assignor to Linde A. G., Hoelbriegelskreuth, Germany

Filed Jan. 7, 1971, Ser. No. 104,581

Claims priority, application Germany, Jan. 7, 1970, P 20 00 797.0

Int. Cl. F16h *39/46*

U.S. Cl. 60—53 A **10 Claims**



This invention relates to a power transmission with a drive shaft and with an output shaft, and with branched internal power distribution consisting of a direct branch for transmission of mechanical drive and a hydrostatic power transmission in a power branch. The hydrostatic power transmission consists of a primary swash plate unit and a secondary swash plate unit which are disposed coaxially with respect to each other and rest against a common symmetrical control element.

3,664,129

HYDRAULIC COOLING SYSTEM

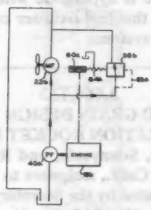
Delmar G Schwab, Portland, Oreg., assignor to Hyster Company, Portland, Oreg.

Original application May 8, 1968, Ser. No. 727,442, now Patent No. 3,540,540, dated Nov. 11, 1970. Divided and this application June 3, 1970, Ser. No. 42,998

Int. Cl. F15b *21/04*

U.S. Cl. 60—53 R **25 Claims**

A cooling system for a lift truck which includes a hydrostatic cooling fan mounted within a duct portion of the counterweight rearwardly of the engine and radiator to draw engine heat through the radiator and dissipate it from the rear of the truck. In one embodiment the fan motor is driven by a fixed displacement pump and is connected in series with other hydraulic accessories. A thermo-modulated pressure relief valve connected in parallel with the fan motor varies the differential pressure across the fan motor and thus fan speed in response to changes in temperature of transmission oil and largely independently of system pressures and engine



speed. In a second embodiment a hydraulic fan motor is driven by a variable pressure compensated, variable displacement pump. The motor is connected in series with a thermo-modulated pressure-reducing valve and in parallel with other hydraulic accessories of the lift truck to vary fan speed with variations in engine temperature and independently of variations in system pressures and engine speed.

3,664,130

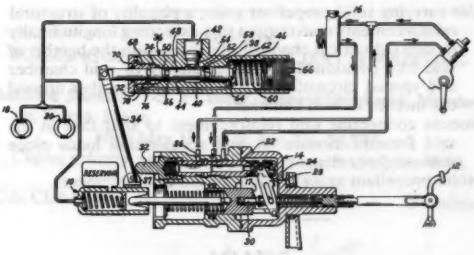
HYDRAULIC BRAKE PRESSURE LIMITING DEVICE

Robert E. Meyers, South Bend, Ind., assignor to The Bendix Corporation

Filed Nov. 16, 1970, Ser. No. 89,725

Int. Cl. F15b *7/00*, *11/10*; B60t *8/06*

U.S. Cl. 60—54.5 P **8 Claims**



A pressure limiting device is provided which prevents the output pressure from a power braking system from exceeding the brake line pressure capacity. During normal brake application the pressure limiting device does not function. If hydraulic boost pressure combined with manual operator input force become too great, and brake line pressure exceeds a predetermined value which threatens to rupture the brake line hoses, the limit device functions to prevent further system pressure buildup.

3,664,131

HYBRID ROCKET FUEL AND PROCESS OF PROPULSION USING TETRAFORMALTRIAZINE

Eugene D. Vessel, Santa Clara, Calif., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed Feb. 1, 1966, Ser. No. 523,976

Int. Cl. C06d *5/10*

U.S. Cl. 60—220 **4 Claims**

Tetraformal-tris-azine is a high energy fuel material suitable for use in hybrid rocket motors either as a compound per se or admixed with suitable binders.

3,664,132
HYPERGOLIC PROPELLANT SYSTEMS USING TETRAFORMALTRISAZINE

Eugene D. Vessel, and Robert W. Ebeling, Jr., both of Santa Clara, Calif., assignors to United Aircraft Corporation, East Hartford, Conn.

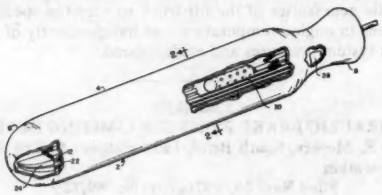
Filed Feb. 14, 1966, Ser. No. 527,099
Int. Cl. C06d 5/10
U.S. Cl. 60—220 3 Claims

Tetraformaltrisazine is hypergolic with respect to concentrated nitric acid and this fuel oxidizer combination is usable in hybrid combustion systems.

3,664,133
SUPPORTED GRAIN DESIGN FOR HIGH ACCELERATION ROCKET MOTORS

Bernard L. Iwanciow, Sunnyvale, and Robert A. Chase, Los Altos Hills, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy

Filed June 30, 1965, Ser. No. 469,974
Int. Cl. F02k 9/04
U.S. Cl. 60—255 10 Claims



1. A solid propellant rocket motor comprising a case having a generally cylindrical chamber section, a forward closure, and a nozzle section;

for carrying solid propellant grain, a plurality of structural reinforcements constituting ribs extending longitudinally in said cylindrical chamber, disposed with the heights of said ribs positioned generally radially of said chamber and spaced circumferentially from one another around the interior of said chamber;

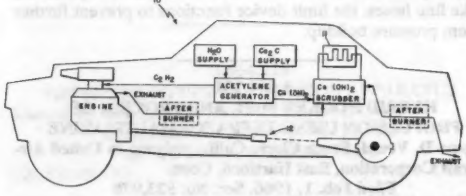
means connecting said reinforcement to said case at the said forward closure so that acceleration loads place said reinforcements in tension; and

solid propellant grain bonded to said reinforcements.

3,664,134
COMBUSTION SYSTEM

Joseph R. M. Seltz, Boston, Mass., assignor to The Whole Earth Corporation, Rockland, Mass.

Filed Aug. 10, 1970, Ser. No. 62,329
Int. Cl. F01n 3/16; F02b 75/10
U.S. Cl. 60—274 18 Claims

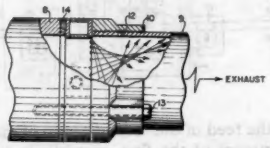


An internal combustion system comprising structure defining a reaction zone for reacting calcium carbide and water to obtain acetylene and calcium hydroxide, structure defining a combustion zone for burning acetylene and producing motive power, including means for transferring acetylene to said combustion zone, and means for passing combustion products of the combustion zone through the calcium hydroxide slurry produced by the reaction zone.

3,664,135
POLLUTION CONTROL AND COOLING DEVICE FOR EXHAUST SYSTEMS

Odrey J. Lirette, 125 York, Belle Chasse, La.

Filed Sept. 14, 1970, Ser. No. 71,767
Int. Cl. F01n 3/04
U.S. Cl. 60—310 4 Claims

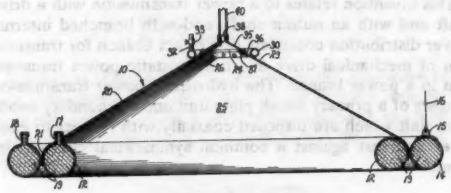


Exhaust cooling system for a marine engine which prevents any heat corrosion deterioration of the exhaust pipe and eliminates substantially all air pollution from the exhaust; the system includes a water spray element immediately adjacent to the exhaust manifold which injects spiraling divergent, crossing water sprays about 360° of the element's circumference at the very beginning of the exhaust system by means of a basic wafer structure interposed between and in line with the manifold and the exhaust pipe; two embodiments are disclosed, one designed for insertion between flanges and the other for insertion between a screw thread/flange joint; the water sprays cool down the exhaust sufficient to allow touching of the exhaust pipe throughout its length and absorb practically all of the solid pollutants in the exhaust fumes.

3,664,136
COLLECTING DEVICE FOR SUBMARINE OIL LEAKAGE

Claude C. Laval, Jr., 2444 North Farris Ave., and Pete P. Peters, 1132 E. Santa Ana Ave., Both of Fresno, Calif.

Filed Nov. 28, 1969, Ser. No. 880,728
Int. Cl. E02b 3/00, 15/04; E02d 23/00
U.S. Cl. 61—1 12 Claims



A device for collecting oil leakage from formations beneath a body of water constructed of flexible, impervious sheet material for compact storage that can be readily erected for use by inflation. The device has a pair of predetermined upper and lower torus-shaped envelopes connected by a frusto-conical shroud with the lower envelope being of a larger diameter and adapted to be filled with a non-buoyant material to distend the same and to open the shroud to its frusto-conical form in circumscribing relation to a point of oil leakage. The upper envelope is relatively smaller and is adapted to be inflated with air to make it buoyant and to circumscribe an opening having a discharge

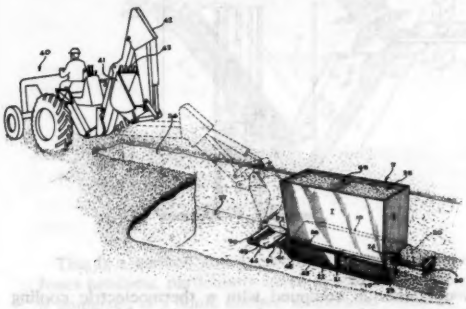
conduit extended therefrom for transferring the oil leaking from the bottom of the body of water internally of the collecting device to the surface.

3,664,137

SYSTEM FOR CONSTRUCTING DRAIN LINES

James E. Lett, 5800 Paula Drive, Knoxville, Tenn.

Filed May 11, 1970, Ser. No. 36,021
Int. Cl. E02b *11/02*; E02f *5/12*
U.S. Cl. 61—11 9 Claims



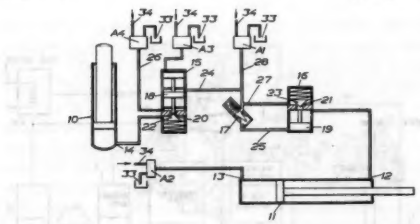
A system for constructing a drain line including laying a uniformly thick and contoured bed of particulate material, such as gravel, within the confines of a trench.

3,664,138

MINE ROOF SUPPORT CONTROL SYSTEM

Kenneth Cooper, Orrell, near Wigan, England, assignor to Gullick Dobson Limited, Ince, Wigan, England

Filed Mar. 17, 1970, Ser. No. 20,324
Claims priority, application Great Britain, Mar. 26, 1969, 15,839/69
Int. Cl. E21d *15/44*
U.S. Cl. 61—45 D 5 Claims



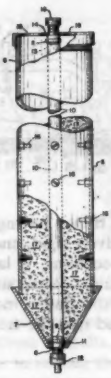
Mine roof supports have a fluidic logic control system for raising and lowering the supports and for advancing the supports in the form of a number of units one on each support. Each unit has a first OR gate which controls a first interface valve to cause the support to lower and advance itself, a second interface valve causing the support to rebrace itself controlled by a second OR gate interconnected with the first through an AND gate which receives inputs from the first OR gate and a sensor denoting that the advance has been completed, an AND gate receiving inputs from a sensor denoting that the support is rebraced and from the second OR gate to provide an input for the first OR gate of the next unit and a reset signal which is passed through a delay restrictor to reset the first OR gate of the support.

3,664,139

REMOVABLE SELF-JETTING PILE

Richard F. Sexauer, 140 Munsey Place, Manhasset, Long Island, N.Y.

Filed Oct. 1, 1969, Ser. No. 862,684
Int. Cl. E02d *7/24*, *5/60*
U.S. Cl. 61—53.74 1 Claim



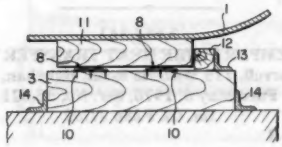
A removable self-jetting pile comprises a body shell, a concrete conically shaped nose portion, and a jetting tube extending from an opening in the nose portion to the upper portion of the shell. The pile is formed by setting one end of the shell in an inverted truncated cone-shaped pouring form, mounting the jetting tube in the truncated end of the form and supporting it within the shell, and pouring concrete into the shell until the pouring form and at least a lower adjacent portion of the shell are filled with the concrete.

3,664,140

BUILDING-SLIP HAVING A RESILIENT SUPPORTING MEMBER

Soichiro Shimizu, 7-5, 2 Chome, Higashi-Shimbashi, Minato-ku, Tokyo, Japan

Filed May 19, 1970, Ser. No. 38,796
Claims priority, application Japan, May 28, 1969, 44/40950
Int. Cl. B63c *3/00*
U.S. Cl. 61—64 3 Claims



The present invention relates to a building-slip for ships having a resilient supporting member characterized in that a resilient supporting member consisting of a synthetic resin sliding plate secured integrally to the upper surface of a resilient material such as rubber is placed on and fixed to the lower wooden block secured to the base of building-slip.

3,664,141

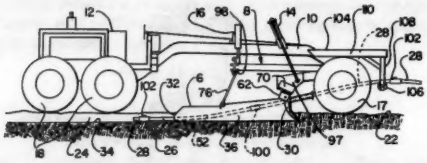
RIGID PIPE LAYING APPARATUS

Shelford S. Wyatt, P.O. Box 8, Esparto, Calif.

Filed June 1, 1970, Ser. No. 42,401
Int. Cl. E02f *5/10*; F16l *1/00*
U.S. Cl. 61—72.5 12 Claims

A trencher adapted to be secured to graders and like construction equipment is provided with a rearwardly and

downwardly sloping pipe passageway which terminates at the aft end of the trencher and exhibits a gentle curvature permitting elastic deflection of the pipe as it moves through the passageway. The trencher is rigidly supported from the grader frame at the forward end above a throw-out plate and at a rearwardly spaced intermittent point to assure the formation of a straight line trench having a closely controlled and constant depth. Relatively rigid, endless pipe, which may include intermittent T-sections, is laid out over the ground, picked up by a pipe guidance and suspension device mounted to the forward end of the grader, moved into and through the passageway and placed into the trench as the grader moves along.

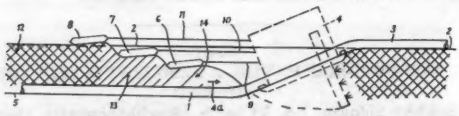


3,664,142

METHOD OF BURYING AN OBJECT IN THE SOIL

Joost Werner Jansz, Rijswijk, Netherlands, assignor to Nederlandse Maatschappij voor Werken Buitengaats (Netherlands Offshore Company) N.V., The Hague, Netherlands

Filed Sept. 3, 1970, Ser. No. 69,236
Int. Cl. F16l 1/00; E02f 5/12
U.S. Cl. 61—72.4 **3 Claims**



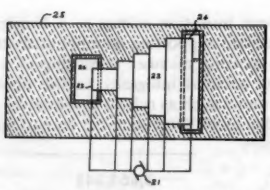
A method of burying objects, for example pipelines and cables in the bottom of the sea includes loosening the soil, laying the object in the loosened soil and compacting the soil placed on top of the object laid by means of vibrators.

3,664,143

LOW TEMPERATURE HEAT TRANSFER DEVICE

Robert L. Carroll, 115 Wisteria Road, Hanahan, S.C.

Filed May 8, 1970, Ser. No. 35,821
Int. Cl. F25b 21/02
U.S. Cl. 62—3 **7 Claims**



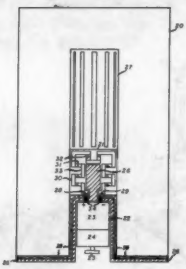
A heat transfer device for obtaining extremely low temperatures which transfers heat by electrical means through a series of transfer units of differing size thereby allowing for the successive lowering of temperature through each unit. Each transfer unit is constructed with filaments of superconducting material through an insulated block.

3,664,144

SELF POWERED REFRIGERATED DISPOSABLE CONTAINER

Robert I. Sarbacher, Arcadia, Calif., assignor to John S. Bogue, Santa Monica, Calif.

Filed Dec. 15, 1969, Ser. No. 884,957
Int. Cl. F25b 21/02
U.S. Cl. 62—3 **6 Claims**



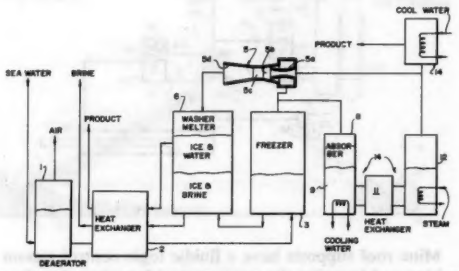
A container is equipped with a thermoelectric cooling device powered by a reserve battery which may be placed in a cavity within the container. An extension of the cold zone of the Peltier cooling device projects into the container in such a manner as to distribute the cooling surface to effect more rapid cooling of the contents. A heat exchanger is provided to carry away both the heat generated in the Peltier device and the heat generated by the internal resistance of the reserve battery during discharge. Provision is made to prevent heat carried by the battery terminals from entering the cooling compartment.

3,664,145

VACUUM-FREEZING, EJECTOR ABSORPTION SOLUTION SEPARATION SYSTEMS AND METHODS

Wallace E. Johnson, 1116 Olympian Boulevard, Beloit, Wis.

Filed Oct. 13, 1969, Ser. No. 865,834
Int. Cl. B01d 9/04
U.S. Cl. 62—58 **20 Claims**



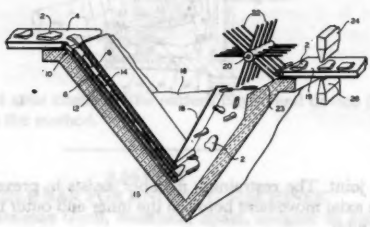
There is disclosed herein novel systems and methods for separating a solvent in substantially pure form from a solution including freezer means for producing vapors and a slurry of solvent and solute, means for separating a frozen solvent and liquid solute, ejector means for moving the major portion of the solvent vapor from the freezer means, bypass means for increasing the temperature and pressure of the remaining portion of the solvent vapor produced in the freezer means and means for bypassing the remaining portion of the solvent vapors from the freezer means to the bypass means.

3,664,146

FOOD PRODUCT QUICK FREEZING METHOD AND APPARATUS

Edward E. Butts, Niles, Mich., assignor to Clark Equipment Company

Filed Dec. 18, 1970, Ser. No. 99,566
Int. Cl. F25d *13/06*
U.S. Cl. 62—63 6 Claims



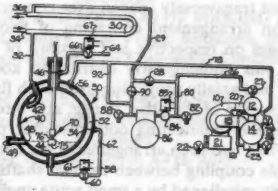
This is a method and apparatus for the quick freezing of foods products, particularly meat, in which the food product is immersed in a liquid coolant maintained below 32° F. The liquid coolant, in the preferred form, is a halocarbon compound particularly dichlorodifluoromethane (refrigerant 12). The food product is pressed into a flat position by being held between two belts as it is immersed in the refrigerant for freezing. After freezing, the product floats to the top of the refrigerant and is retrieved and passed between low pressure steam or hot air jets to thaw the surface of the food parcel to prepare it for wrapping. After the food parcel is wrapped, it is again refrozen.

3,664,147

PURGE APPARATUS FOR REFRIGERATION SYSTEM

John G. Blackmon, Charlotte, N.C., assignor to Carolina Products, Inc., Charlotte, N.C.

Filed Aug. 19, 1970, Ser. No. 65,217
Int. Cl. F25b *43/04*
U.S. Cl. 62—85 14 Claims



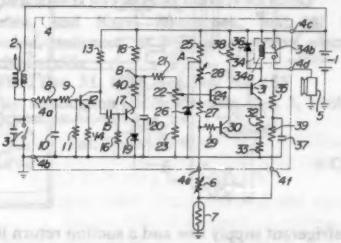
A purge apparatus for removing foreign non-condensable gases from a refrigeration system including a closed vessel adapted to receive the foreign gases together with a portion of the refrigerant from the high pressure region of the system. The vessel is cooled to condense the refrigerant, and a float actuated electrical switch is provided within the vessel to open a first valve for discharging the condensed refrigerant upon the refrigerant reaching a predetermined level, and a second valve for venting the non-condensable gases to the atmosphere upon a drop in the refrigerant level. The discharged condensed refrigerant is utilized to cool the vessel by evaporating the same in an area about the outer walls of the vessel, and then returned to the low pressure region of the system.

3,664,148

COOLER CONTROL SYSTEM FOR AUTOMOBILE COOLERS

Hisashi Yonezu, Aichi, Japan, assignor to Nippondenso Kabushiki Kaisha, Showa-cho, Kariya-shi, Aichi-ken, Japan

Filed Dec. 28, 1970, Ser. No. 101,775
Claims priority, application Japan, Jan. 13, 1970, 45/4294
Int. Cl. B60h *3/04*
U.S. Cl. 62—133 2 Claims



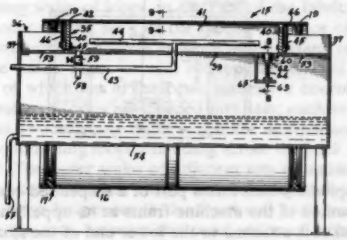
A cooler control system suitable for automobile coolers. It includes an engine speed detection circuit and a temperature control circuit to control the operation of a cooler through the combination of these circuits, thereby separating the cooler from the engine to reduce the engine load during low engine speed operation so as to overcome the insufficiency of the engine output under the low engine speed operating condition. The engine speed detection circuit of the cooler control system according to the invention includes an integrating capacitor, whose discharging circuit comprises a transistor, diode and resistor, whereby the fluctuation of the preset engine speed is prevented.

3,664,149

CONTROLLED REFRIGERATION APPLICATION TO A METALLIC CONVEYOR BELT

Milton W. Garland, and Bruce S. Schaeffer, both of Waynesboro, Pa., assignors to Frick Company, Waynesboro, Pa.

Filed Oct. 26, 1970, Ser. No. 84,022
Int. Cl. F25d *17/02*
U.S. Cl. 62—201 8 Claims



Apparatus for controlling the flow of refrigerant in direct engagement with the bottom surface of a metallic conveyor belt. The apparatus includes an open-top trough the ends and sides of which are in contact with the bottom surface of the conveyor belt and the sides of the trough permit leakage and control the flow of refrigerant regardless of the change in viscosity due to varying temperatures of the refrigerant.

3,664,150

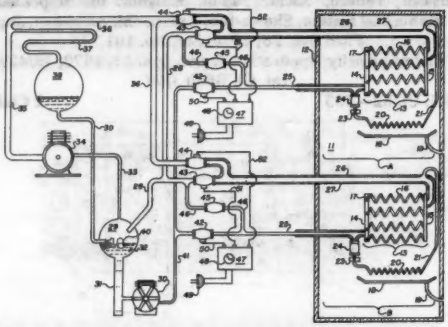
HOT GAS REFRIGERATION DEFROSTING SYSTEM

Velt C. Patterson, 5511 Basswood Lane, Austin, Tex.

Filed Dec. 30, 1970, Ser. No. 102,669
Int. Cl. F25d *21/00*
U.S. Cl. 62—234 11 Claims

An improved dual refrigeration. and defrost system having cycles of refrigeration and defrost so integrated that the heat

collected from one bank of refrigerating evaporators is used for defrosting another evaporator unit with the refrigerant lines into the refrigeration chamber being reduced to a two



pipe refrigerant supply line and a suction return line that permits almost all critical control components to be located outside of the refrigeration chamber to facilitate safe and convenient maintenance and repair of said control components.

3,664,151

SPINDLE FOR CENTRIFUGES

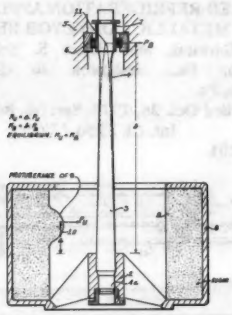
Kurt Pause, Grevenbroich, Germany, assignor to Maschinenfabrik Buckau R. Wolf Aktiengesellschaft, Grevenbroich, Germany

Filed Oct. 16, 1969, Ser. No. 866,882

Claims priority, application Germany, Oct. 16, 1968, P 18 032 49.0

Int. Cl. F16c *1/00*

U.S. Cl. 64—1 **2 Claims**



A spindle which forms part of a suspended centrifugal and is mounted in the machine frame at its upper end. The bowl or basket is attached to the lower end of the spindle and the latter tapers from the lower toward the upper end so that its flexural strength is at least substantially constant all the way from the hub of the bowl or basket to the bearing in the frame.

3,664,152

CONSTANT VELOCITY UNIVERSAL JOINTS

Jerzy Witold Macielinski, Birmingham, England, assignor to GKN. Birfield Transmissions Limited, Erdington, Birmingham, England

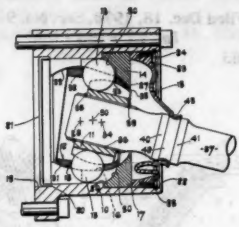
Filed Feb. 4, 1971, Ser. No. 112,725

Claims priority, application Great Britain, Feb. 4, 1970, 5,315/70

Int. Cl. F16d *3/30*

U.S. Cl. 64—8 **8 Claims**

A constant velocity universal joint includes balls which transmit torque between the joint outer member and the joint inner member. An annular restraining member is formed separately from and acts between the outer member and a cage which serves to guide the balls into the bisector plane of



the joint. The restraining member assists in preventing relative axial movement between the inner and outer members of the joint.

3,664,153

TORQUE TRANSMISSION ARRANGEMENT

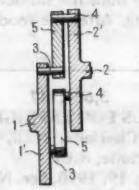
Eisuke Sugahara, Tokyo, Japan, assignor to Nippon Piston Ring Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 10, 1970, Ser. No. 88,321

Claims priority, application Japan, Dec. 29, 1969, 45/1711; 45/1712

Int. Cl. F16d *3/04*

U.S. Cl. 64—31 **5 Claims**



Two shafts which are at least approximately parallel and rotate about transversely spaced axes connected by a torque transmission arrangement consisting of two axially spaced radial flanges on respective end portions of the shafts, three eccentric pins equiangularly distributed about the axis of each shaft and axially projecting from each flange toward the plane of rotation of the other flange, and three links of equal length hingedly connecting corresponding pins on the two flanges. When two such arrangements are connected in series by a flexible coupling between the two shafts, the shafts may be angularly misaligned by a small acute angle.

3,664,154

METHOD OF OPERATING A WARP KNITTING MACHINE, ESPECIALLY A RASCHEL KNITTING MACHINE, AND DEVICE FOR CARRYING OUT THE METHOD

Egon Fritz, Monchengladbach, Germany, assignor to Walter Reiners, Monchengladbach, Germany

Filed Nov. 13, 1969, Ser. No. 876,273

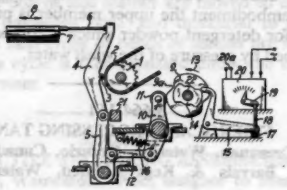
Claims priority, application Germany, Nov. 13, 1968, P 18 08 479.2

Int. Cl. D04b *23/00*

U.S. Cl. 66—86 **5 Claims**

Method of operating a warp knitting machine equipped with a pattern-changing device for changing pattern chains which comprises reducing the operation of the machine from

a higher to a lower speed before changing a pattern, and increasing the operation of the machine from the lower to the



higher speed after changing the pattern chain, and device for carrying out the method.

3,664,155

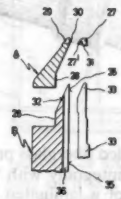
NEEDLE BAR FOR KNITTING MACHINES

Jose Maria Dalmau Guell, Badalona, Spain, assignor to Jumberca, S.A., Jacinto Benavente s/n, Badalona (Prov. Barcelona), Spain

Filed Nov. 24, 1969, Ser. No. 879,447

Int. Cl. D04b *15/00*

U.S. Cl. 66—115 **3 Claims**



The knitting head is divided, parallel to the looping area, into two parts firmly fixed together. The first part carries a plurality of knocking off bits and delimits frontally the tricks in which the needles move. The second part carries a plurality of spacers which are aligned with and form extensions of the knocking off bits and delimits laterally the tricks.

3,664,156

GARMENT AND METHOD OF MAKING IT

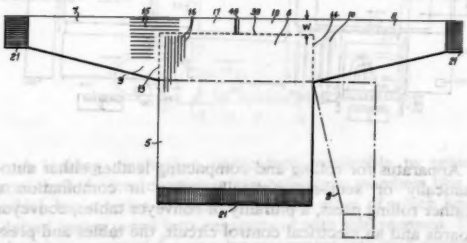
Max W. Betts, Coventry, and Frank Robinson, Borrowash, both of England, assignors to Courtaulds Limited, London, England

Filed June 5, 1970, Ser. No. 43,672

Claims priority, application Great Britain, June 18, 1969, 30,866/69

Int. Cl. D04b *7/10*; A41b *9/06*

U.S. Cl. 66—176 **10 Claims**



A blank for manufacture of a knitted sleeve garment comprises front and rear upper body portions each constituted by a piece of flat fabric and having side edges joined, on the knitting machine, to shoulder regions of the sleeves, the said shoulder regions having extensions arranged to be joined to upper edges of the said front and rear upper body portions. A method of knitting such a blank is also described.

3,664,157

PATTERNED STITCH-BONDED FABRIC

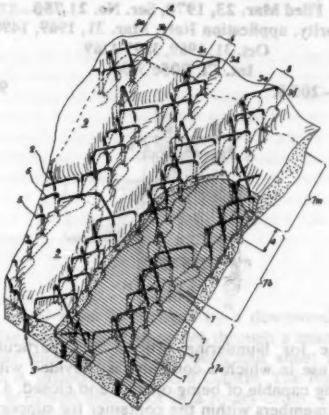
Zdenek Kochta, and Karel Dvoracnek, both of Brno, Czechoslovakia, assignors to Vynkumny ustav pletarsky, Brno, Czechoslovakia

Filed Dec. 31, 1968, Ser. No. 788,155

Claims priority, application Czechoslovakia, Jan. 3, 1968, 52-68

Int. Cl. D04b *7/12*

U.S. Cl. 66—190 **6 Claims**



A patterned stitch-bonded fabric having a basic fibrous layer which is stitch-bonded with a binding warp thread thereby forming wales of loops on the face of the fabric and connecting loops on the back of the fabric. The face of the fabric has, furthermore, courses of loops which extend transversely to the wales. These courses of loops are divided into groups each of which has at least two successive courses of loops. The wales of loops are divided into sets; each set includes at least two adjacent wales which are interconnected by means of connecting loops extending across the back face of the fabric. The outer wales of adjacent sets of wales are not interconnected to each other and, consequently, the basic fibrous layer bulges out in the front and back face of the fabric in the area between the outer wales of adjacent sets of wales. The outer wales of the sets of wales in adjacent groups of courses of loops are offset with respect to each other.

3,664,158

APPARATUS FOR TREATMENT OF FABRICS WITH LIQUID AMMONIA

Olav Skaathun, Kolbotn, Norway, and Walter S. Troope, Latham, N.Y., assignors to Tedeco Textile Development Co. A/S, Oslo, Norway

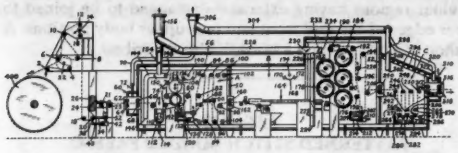
Continuation-in-part of application Ser. No. 834,730, June 19, 1969, now abandoned. This application Feb. 5, 1970, Ser. No. 8,987

Int. Cl. D06c *1/00*

U.S. Cl. 68—5 D **19 Claims**

The invention relates to an apparatus for the treatment of fabrics with liquid ammonia to improve several properties of

the fabrics. The apparatus is provided with control means



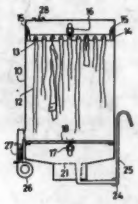
controlling the tensions to which the fabrics are subjected during the treatment.

3,664,159

HOUSEHOLD DEVICE FOR WASHING, SMOOTHING AND DRYING ARTICLES OF APPAREL, UNDERWEAR CLOTHING AND THE LIKE

Lamberto Mazza, Pordenone, Italy, assignor to Industrie A. Zanussi S.p.A., Pordenone, Italy

Filed Mar. 23, 1970, Ser. No. 21,750
Claims priority, application Italy, Mar. 31, 1969, 14902 A/69; Oct. 31, 1969, 3893 A/69
Int. Cl. B05c *5/00*
U.S. Cl. 68—205 R **9 Claims**



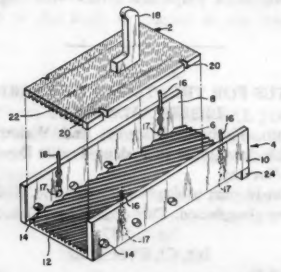
A device for laundering articles and particularly for household use in which a container is provided with an access opening capable of being opened and closed, a plurality of support members within the container for supporting articles in a freely hanging condition and a set of nozzles for supplying detergent and rinsing liquids within the container below the freely hanging articles, the nozzles having orifices for vertically directing the liquids upon the freely hanging articles for cleansing and rinsing purposes as well as effecting a shaking of the articles and preventing the articles from sticking together and means for imparting controlled movement to said nozzles.

3,664,160

WASHBOARD

Eloy Fernando Muniz, Guayama Street No. 271, Hato Rey, P.R.

Filed Oct. 12, 1970, Ser. No. 79,755
Int. Cl. D06f *35/00*
U.S. Cl. 68—224 **3 Claims**



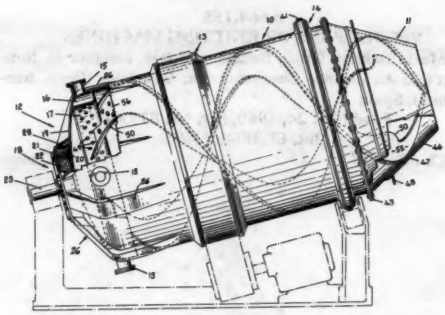
The device for washing clothes is portable and consists of upper and lower parts which are separated to put between them the fabric to be washed, after which they are brought together and reciprocated horizontally in opposite directions to effect washing. The abutting faces of the two parts are provided with angular grooves which are oppositely directed to provide added friction to the fabric being washed. In a preferred embodiment the upper member is provided with a container for detergent powder which is forced to the fabric being washed by pressure of the wash water.

3,664,161

FIBERGLASS PROCESSING TANK

Fred D. Cressman, Waterloo, Ontario, Canada, assignor to Canada Barrels & Kegs Limited, Waterloo, Ontario, Canada

Filed Oct. 6, 1970, Ser. No. 78,503
Int. Cl. C14c *15/00*
U.S. Cl. 69—30 **13 Claims**



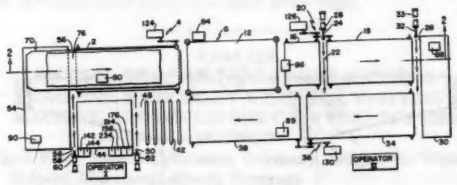
A molded resin-bonded fiberglass processing tank having a hub structure formed integrally with the end wall. The hub structure is made up of a laminated core overlayed with a fiberglass laminate. A gudgeon is attached to the core. Reinforcing ribs are laid on the end wall, the ribs, which radiate from the hub, extend over the contiguous portions of the cylindrical wall of the tank. The ribs are formed with a center core, preferably of foamed plastic. A belt track and a support ring are also formed integrally on the cylindrical wall of the tank.

3,664,162

LEATHER ROLLING APPARATUS

Hans Christoph Schrade, Bensberg-Refrath, Germany; William F. del Guidice, Durbin, and Charles W. Wimer, Bartow, both of W. Va., assignors to Howes Leather Company, Inc., Boston, Mass.

Filed Dec. 28, 1970, Ser. No. 101,835
Int. Cl. C14b *1/30*
U.S. Cl. 69—46 **8 Claims**



Apparatus for rolling and compacting leather either automatically or semi-automatically using in combination a leather rolling press, a plurality of conveyor tables, conveyor boards and an electrical control circuit, the tables and press being positioned to form a continuous pathway for the boards into and out of the press, each board being adapted to receive thereon at a loading table a leather crop or a pair of

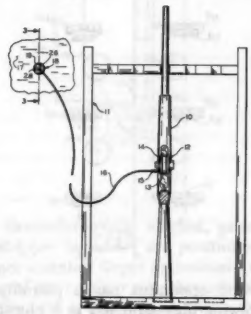
bends, the boards and their carried leather successively being passed to an inlet table, then into the rolling press from the inlet table, the leather being rolled in two stages in the press, after which the boards and leather are moved to an exit table, thence an unloading table, and thereafter to a loading table where the next crops or bends of leather are loaded on the boards. The cycle is then repeated under the control of the electrical system.

3,664,163

PROTECTIVE ANCHORING ASSEMBLAGE

Daniel J. Foote, Wauwatosa, Wis., assignor to Master Lock Company

Filed Feb. 24, 1970, Ser. No. 13,395
Int. Cl. E05b *73/00;* **A47f** *7/00;* **B61l** *3/00*
U.S. Cl. 70—58 **6 Claims**



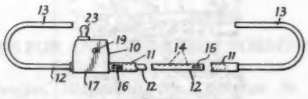
To prevent the theft, removal or unauthorized use of a displayed or stored bulky item such as a fire-arm, implement or the like, while permitting handling or inspection thereof within a limited range, this protective anchoring assemblage includes a base member non-removably mounted on an adjacent support by screws or the like, with a cover secured to the base member and rendering the screws inaccessible. The base member carries an outwardly projecting connector to which is non-removably affixed one end of an elongated flexible connection or leash. The outer end portion of said leash is lockingly engaged with the item to be protected in a manner to permit the latter to be handled and moved through a limited range, but it cannot be unauthorizedly removed or wrongfully appropriated.

3,664,164

LOCKING MECHANISMS

Kitty Zaidener, 36, Hamiton Court, Maida Vale, London, W. 9, England

Filed Oct. 13, 1970, Ser. No. 80,316
Claims priority, application Great Britain, Apr. 8, 1970, 16,783/70
Int. Cl. B60r *25/02*
U.S. Cl. 70—202 **5 Claims**



A locking mechanism particularly applicable to vehicle anti-theft devices comprises two telescopic members one of which has a series of recesses and the other of which has a detent spring urged into engagement with said recesses. The detent is mounted for angular movement into said recesses whereby it locks the two members against relative movement in one direction by a wedging action while permitting movement in the other and means operable for example by a key is provided to release the members for movement in both directions by moving said detent against the spring loading.

ERRATA

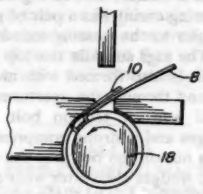
For Classes 70—292 and 72—250, see:
Patent Nos. 3,664,074 and 3,664,231

3,664,165

METHOD AND DIE CONSTRUCTION FOR FAN BLADE

J. D. Harvill, and Kenneth C. Harlan, both of Indianapolis, Ind., assignors to Wallace-Murray Corporation, New York, N.Y.

Filed Aug. 4, 1969, Ser. No. 847,323
Int. Cl. B21b *15/00*
U.S. Cl. 72—168 **6 Claims**



A flat metal sheet is engaged by a downwardly moving rectangular anvil. The anvil passes through a space between two planar supports, carrying contiguous sheet metal portions with it, distorting them to a U-form. The bight portion of the U is moved into a slot in a rotary drum. The anvil is withdrawn and the drum rotates, carrying the sheet against curved cam surfaces to yield the finished configuration.

3,664,166

METHOD AND DEVICE FOR THE CONTINUOUS ROLLING OF THIN STRIPS

Pierre Gay, La Tour en Jarez, France, assignor to Compagnie des Ateliers et Forges de la Loire (St.-Chamond, Firminh, St.-Etiene Jacob Holtzer), Paris, France

Filed Apr. 18, 1969, Ser. No. 817,389
Claims priority, application France, May 16, 1968, 152012
Int. Cl. B21b *1/28*
U.S. Cl. 72—205 **3 Claims**

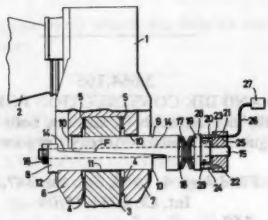
A previously hot-rolled strip is subjected to a first thickness-regularizing pass in the cold state through a mill permitting of not maintaining to a constant value the thickness variations of the strip before and after the rolling operation, that is, imparting to the strip an elongation to which a constant value is not imposed, that first pass being followed by several rolling passes performed in rolling stands in which a predetermined elongation is imparted to the strip.

3,664,167

ROLLER TABLES

Ernst Theodor Sack, Hosel, Germany, assignor to Maschinenfabrik Sack GmbH, Dusseldorf-Rath, Germany

Filed Sept. 16, 1970, Ser. No. 72,763
Claims priority, application Germany, Sept. 20, 1969, P 19 47 765.7
Int. Cl. B21b *39/20*
U.S. Cl. 72—251 3 Claims



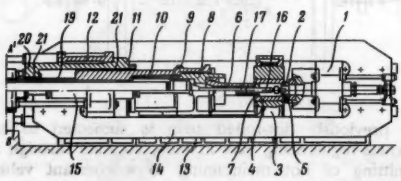
A roller table is described having a frame with a longitudinal wall on which a number of bearing casings are rigidly mounted. Each bearing casing has a pair of parallel lugs projecting at right angles to the bearing axis and each formed with an aperture. The lugs straddle the top edge of the longitudinal wall which is also formed with an aperture and a pair of wedges extend through the apertures in the lugs and in the longitudinal wall. A tension bolt is provided for tightening the wedges and a strong compression spring is interposed between a nut on the bolt and the wedges to maintain tightness of the wedges even after wear of the contacting surfaces of the wedges, the wall and the lugs. The spring is arranged to be compressed by a hydraulic thrust device temporarily attached to a free end of the bolt. The nut is then tightened and the hydraulic device removed.

3,664,168

HORIZONTAL HYDRAULIC PRESS FOR TUBULAR ARTICLES

Lev Mikhailovich Shtin, prospekt Ordzhonikidge, 3, kv. 49; Nikolai Feodosovich Grebnev, Kirovgradskaya, 63, kv. 18; Ljudmila Sergeevna Satovskaya, prospekt Ordzhonikidze, 3, kv. 77; Mikhail Grigorievich Rasseikin, ulitsa Lomonosova, 19, kv. 7; Sergei Grigorievich Khirdzhiev, ulitsa Mashinostroitelei, 51, kv. 38; Evgeny Titovich Perevozchikov, ulitsa Sotsialisticheskaya, 7, kv. 4; Sofia Stepanovna Zagulina, ulitsa 40 ler Oktyabrya, 9, kv. 29; Vladimir Nikolaevich Duda, ulitsa Kultury, 6, kv. 15; Mikhail Andreevich Karasev, ulitsa Kalinina, 66, kv. 9, all of Sverdlovsk; Viktor Mikhailovich Rozkov, 2 Truzhennikov pereulok, 4, kv. 3, and Valentin Fedorovich Shtamburg, Varshavskoe shosse, 135a, korpus 4, kv. 309, both of Moscow, all of U.S.S.R.

Filed Feb. 12, 1970, Ser. No. 10,720
Int. Cl. B21c *23/20*
U.S. Cl. 72—265 6 Claims



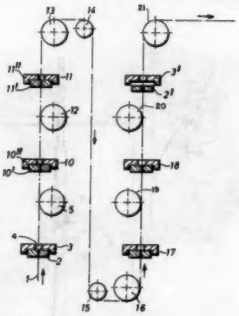
The present invention relates to a horizontal hydraulic press for the manufacture of tubular articles with a cross section variable along its length, mostly drill pipes, which comprises two groups of working cylinders for moving in opposite directions the mandrel which shapes the bore of the pipe; the press is provided with at least two adjustable stops one of which limits the travel of the mandrel with relation to the die in the direction of pressing and the other one — against the direction of pressing.

3,664,169

WIRE DRAWING APPARATUS

Werner Henrich, 6349 Horbach (Dillkreis), Am Wachtgeipfel, Germany

Filed Jan. 8, 1970, Ser. No. 1,370
Claims priority, application Germany, Sept. 12, 1969, P 19 46 221.6
Int. Cl. B21c *1/04, 3/00*
U.S. Cl. 72—278 4 Claims



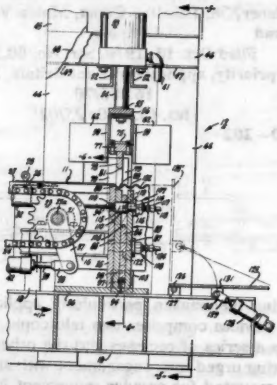
A wire drawing apparatus has a plurality of vertically spaded wire drawing dies arranged in a plurality of drawing stages positioned in side-by-side relationship. Drive rollers are positioned respectively above each of the dies to draw the wire vertically upwardly therethrough and additional rollers are employed to change the direction of wire between drawing stages so that the wire emerging from the top of one drawing stage enters at the bottom of the next drawing stage. The dies are self-centering under the action of the upwardly moving wire.

3,664,170

CURVING METHOD AND APPARATUS FOR RIDGED SHEET MATERIAL

Paul K. Davis, Alameda, Calif., assignor to Pacific Roller Die Co., Inc., Hayward, Calif.

Filed Mar. 16, 1970, Ser. No. 19,974
Int. Cl. B21d *11/04*
U.S. Cl. 72—307 7 Claims



Method and apparatus for forming ridged sheet material into arcuate shape. Sheet material having an elongated major

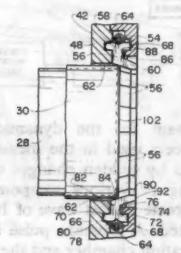
ridge or corrugation extending along a line is curved along said line by progressive formation therealong of a series of corrugations or pleats directed substantially normal to said line.

3,664,171

STRIPPER FOR APPARATUS SUCH AS METALLIC CAN BODY FORMERS

Elpidifor Paramonoff, Los Angeles, Calif., assignor to Standum, Inc., Compton, Calif.

Filed Nov. 13, 1970, Ser. No. 89,259
Int. Cl. B21d *45/00*
U.S. Cl. 72—344 **15 Claims**



A series of circumferentially aligned, generally T-shaped cross section stripper members are positioned in a retainer ring with stripper member finger extensions projecting into a central opening of the retainer ring through which a ram end passes rearwardly with a cup-shaped article thereon and forwardly during stripping of the article from the ram end. The stripper members are received in an annular, inwardly opening recess of the retainer ring, T-shaped in cross section generally corresponding to the stripper members. A circumferentially surrounding garter spring normally urges the stripper members radially inwardly with axially spaced, radially inwardly facing stripper member surfaces abutting corresponding retainer ring recess walls, axially opposite stripper member ends abutting corresponding retainer ring recess end walls and the stripper member finger extensions projecting angularly rearwardly into the retainer ring central opening to a diameter less than the outer diameter of the cup-shaped articles carried by the ram end. During movement of the cup-shaped articles rearwardly through the stripper members by the ram end, the stripper members pivot outwardly about an arcuate surface on the forward ends thereof and over the retainer ring corresponding recess wall, while stripper member rearward arcuate end surfaces slide radially along the retainer ring corresponding recess wall and other surfaces and walls separate permitting such pivoting. After the cup-shaped articles have passed rearwardly the stripper members return generally to normal position so as to engage the ends of the cup-shaped articles upon forward return movement of the ram end with the stripper member finger extensions, thereby forcing the cup shaped articles from the ram end.

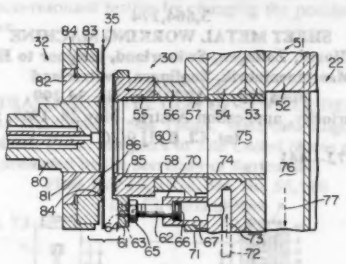
3,664,172

APPARATUS FOR AND METHOD OF FORMING CUP-SHAPED ARTICLES

Daniel S. Cvacho, Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.

Filed June 1, 1970, Ser. No. 41,949
Int. Cl. B21d *24/04*
U.S. Cl. 72—350 **18 Claims**

An apparatus and method is provided wherein a circular sheet blank is formed into a cup-shaped article which is substantially free of defects. The apparatus and method utilize a pair of cooperating die assemblies having a pair of rings provided with a pair of cooperating blank-engaging surfaces each defined by a plurality of alternating concentric grooves and projections. The grooves and projections of one of the surfaces partially intermeshes with associated projections and grooves respectively of the other of the surfaces to define concentric undulations in the peripheral portion of the blank. One of the die assemblies has a male member provided as a



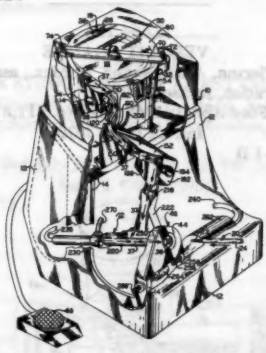
part thereof and the other assembly has a cooperating die cavity whereby upon relatively moving the assemblies together the blank is drawn by the male member into the die cavity enabling the undulations to serve as integral columnar members which allow controlled flow of the peripheral portion to define a tubular wall of the cup-shaped article which is free of defects.

3,664,173

HOPPER FEED CRIMPING MACHINE WITH COMBINATION CONTAINER-HOPPER

Paul A. Haucke, Rahway; Seymour Rosenfeld, Monsey; Ronald W. Schwab, West Orange, and Charles F. Mazzeo, Scotch Plains, all of N.J., assignors to Buchanan Electrical Products Corporation, Union, N.J.

Filed Feb. 9, 1970, Ser. No. 9,700
Int. Cl. B21d *43/20*; H01r
U.S. Cl. 72—424 **25 Claims**



A crimping machine in which electrical contacts of any one of a variety of configurations are supplied in a reservoir of loose contacts held in a container and are serially fed from the container to be advanced, oriented and positioned in a crimping mechanism where each contact is selectively crimped to the end of an electrical wire. The container is in the form of a bowl-shaped insert and is removably coupled with an oscillating mechanism such that the oscillating mechanism oscillates the bowl-shaped insert to serially feed the contacts to a discharge opening in the insert for subsequent advancement through the machine. The insert is provided with a closed top and a removable closure for the discharge opening so that the insert serves as a storage and transportation container for the contacts as well as a hopper for the machine. A plurality of such inserts may be provided, each insert carrying contacts of another configuration, so

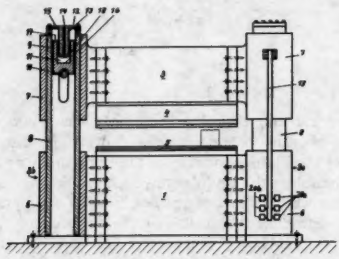
that contacts of various configurations may be supplied to the machine by interchanging the inserts. The means for advancing, orienting, positioning and crimping the contacts include means which are selectively adjustable or readily replaceable in order to accommodate each of the various contact configurations.

3,664,174

SHEET METAL WORKING MACHINE

Eduard Hanni, Zofingen, Switzerland, assignor to Hammerla A.G. Maschinenfabrik, Zonfingen, Switzerland

Filed May 4, 1970, Ser. No. 34,299
Claims priority, application Austria, May 28, 1969, 5078/69
Int. Cl. B21j 9/20
U.S. Cl. 72—441 4 Claims



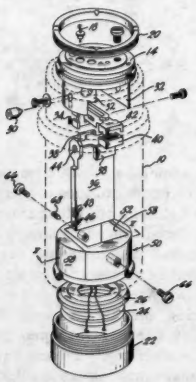
A sheet metal working machine with a worktable has a ram which is controlled by at least two actuating and guiding elements, each fitted with a cylinder and a pressure-operated piston. The piston in each element has two separated working surfaces of different sizes. Each actuating and guiding element has a control organ which acts on the pressure of the individual piston surfaces in accordance with the eccentricity of the load on the ram. Fluid pressure may be used to operate the piston and the control organs may be programmed for regulating the feed of the pressure fluid.

3,664,175

VELOCITY GAUGE

William D. Pierson, Albuquerque, N. Mex., assignor to Sparton Corporation, Jackson, Mich.

Filed Apr. 1, 1969, Ser. No. 811,813
Int. Cl. G01p 15/00
U.S. Cl. 73—1 D 2 Claims



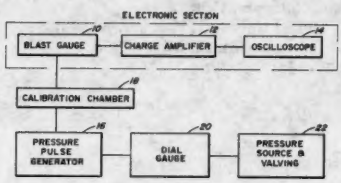
A gauge capable of sensing the velocity at which it is displaced utilizing a pendulous mass dampened within a high viscosity oil, and utilizing polarized electromagnetic deflection means for deflecting the mass for test and calibration purposes.

3,664,176

METHOD AND APPAPATUS FOR THE CALIBRATION OF TRANSDUCERS

Charles S. Mangleburg, Colonial Beach, Va., assignor to The United States of America as represented by the Secretary of the Navy

Filed Mar. 23, 1970, Ser. No. 21,572
Int. Cl. G01l 27/00
U.S. Cl. 73—4 R 2 Claims



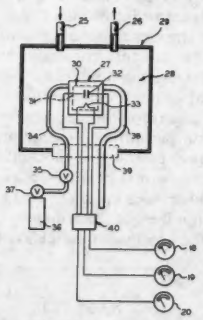
A calibration system for the dynamic calibration of piezoelectric transducers used in the measurement of blast wave pressure caused by sudden changes of fluid pressure, such as in the firing of various weapons. A calibration chamber is used to create a blast wave of 100 psig upon the transducer being tested. A pressure pulse is generated and supplied to the calibration chamber and the electrical output of the transducer is recorded on a storage oscilloscope to form a first trace. A second trace is generated by a charge amplifier containing a calibration circuit having precision capacitors. The second trace is adjusted to fall upon the first generated trace and the transducer charge sensitivity is read directly from the sensitivity control on the charge amplifier. A series of tests can be used to determine the non-repeatability of the transducer and repetition at different pressures will determine its non-linearity.

3,664,177

PORTABLE DEW POINT HYGROMETER

Richard C. Bridgeman, Northbrook, and Wieslaw Gajewski, Evanston, both of Ill., assignors to Vapor Corporation, Chicago, Ill.

Filed Aug. 17, 1970, Ser. No. 64,160
Int. Cl. G01n 25/02
U.S. Cl. 73—17 A 6 Claims

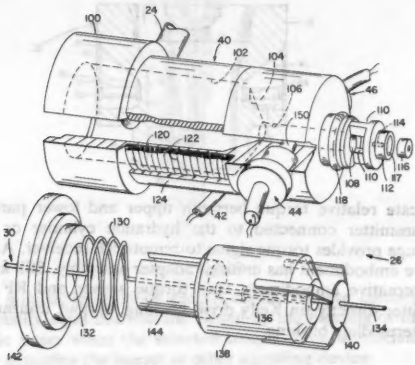


A dew point hygrometer for measuring the moisture content of a gas that includes a self-contained power supply in the form of a battery and a compressed gas supply. The electrical conductivity of the water vapor in the sampling gas near the dew point is measured by a sensor, the temperature of which is also measured as well as the rate of cooling the sensor to determine the dew point temperature of the sampling gas. The battery powers electrical circuitry for making the measurements, while the compressed gas is utilized for cooling the sensor.

3,664,178
FLUID HANDLING APPARATUS

Philip Spergel, Lexington, and Stanley L. Gaines, Wayland, both of Mass., assignors to Instrumentation Laboratory, Inc., Lexington, Mass.

Filed Apr. 7, 1970, Ser. No. 27,199
Int. Cl. G01n *1/00, 7/10*
U.S. Cl. 73—53 20 Claims

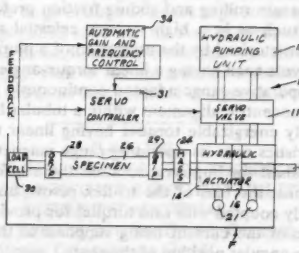


Fluid analysis apparatus includes a sample chamber that has a constituent sensor in it and an inlet conduit connected to the sample chamber. A heater assembly surrounds the inlet conduit. The heater assembly includes a preheater stage, a final heater stage, and a heat supply stage disposed between the preheater and final stages. Tempering fluid is flowed sequentially through the preheater stage, the heat supply stage and final stage and around the sample chamber for maintaining the sample chamber and the constituent sensor at a stable temperature and heating the sample to that same temperature as it flows through the inlet conduit.

3,664,179
APPARATUS AND METHOD FOR CONTROLLING A RESONANT TESTING MACHINE

Donald M. Danko, Parma, and James E. Svarovsky, Cleveland, both of Ohio, assignors to Gilmore Industries, Inc., Cleveland, Ohio

Filed May 11, 1970, Ser. No. 35,996
Int. Cl. G01n *29/00*
U.S. Cl. 73—67.2 29 Claims

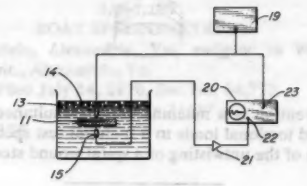


A machine for testing the strength of material specimens by applying a mean and a cyclical load thereto includes a hydraulic actuator connected to the specimen, a servo valve for controlling the flow of hydraulic fluid to and from the actuator and a sensor connected to the specimen. The servo valve is controlled by a train of pulses directed to its actuating coil. The use of pulses as the forcing function allows the system to attain higher operating efficiency. A feedback signal from the sensor is utilized to correct the repetition rate of the pulses to the resonant frequency of the specimen system under test and, after the resonant frequency is attained, to maintain the rate at the resonant frequency. The pulses are area controlled to supply more or less energy to the system as required to maintain the system in resonance at the desired load. A mean load on the specimen is also maintained at a selected value. The machine may be used for standard, non-resonant testing by changing the position of a few switches.

3,664,180
ULTRASONIC DETECTION OF LUMBER DEFECTS

Kent A. McDonald, Cross Plains, Wis., and Roger G. Cox, Loveland, Colo., assignors to The United States of America as represented by the Secretary of Agriculture

Filed July 15, 1970, Ser. No. 55,110
Int. Cl. G01n *29/04*
U.S. Cl. 73—67.6 3 Claims

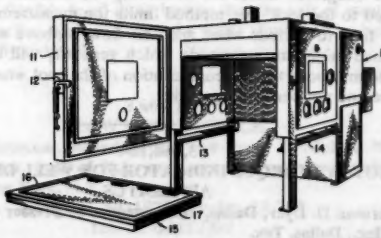


A method of locating, by ultrasonic inspection, internal defects in wood. The transit time of ultrasonic pulses through the wood, in a direction substantially perpendicular to the grain, is measured at approximately one-half inch intervals along the length and across the width of the board. The inspection is made under water. Comparison of the transit times between adjacent measurement locations provides an indication of a defect such as a knot or steep grain area between the measurement points.

3,664,181
FLOOR STRUCTURE FOR A TEST CHAMBER

Charles F. Conrad, and Kieth L. Dadd, both of Holland, Mich., assignors to Thermotron Corporation, Inc., Holland, Mich.

Filed July 25, 1968, Ser. No. 747,555
Int. Cl. G01n *29/00*
U.S. Cl. 73—71.6 10 Claims

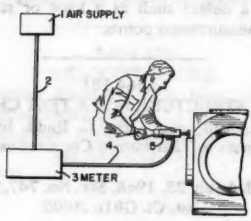


A test chamber having a floor including a flexible sealing diaphragm secured to a frame removable and insertable laterally through an open door together with an exterior vibrating unit adapted to transmit vibrations through the diaphragm.

3,664,182
TENSION-TORSION TESTING MACHINE
Thomas W. Butler, 303 Balsam Drive, Severna Park, Md.
Filed Feb. 25, 1971, Ser. No. 118,740
Int. Cl. G01n 3/08
U.S. Cl. 73—93 5 Claims

The invention is a machine which simultaneously applies tensile and torsional loads to a material test specimen by the utilization of the untwisting of a spiral wound steel wire rope.

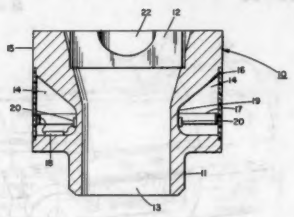
3,664,183
WORK MEASUREMENT SYSTEM
Edwin S. Treible, Jr., Ringoes, N.J., assignor to Ingersoll-Rand Company, New York, N.Y.
Filed June 22, 1970, Ser. No. 48,019
Int. Cl. G01l 23/00
U.S. Cl. 73—133 7 Claims



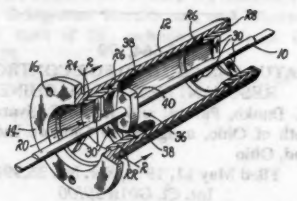
A method and apparatus for measuring the work performed by a governed air-powered tool and including a flow and integrated meter for measuring the amount of air supplied to the tool. The method limits the measurement of the air flow to periods when such air flow is above a predetermined minimum magnitude which generally will be a small amount above the air consumption of the tool when running free and not performing work.

3,664,184
ROTARY TORQUE INDICATOR FOR WELL DRILLING APPARATUS
Norman D. Dyer, Dallas, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.
Filed Sept. 14, 1970, Ser. No. 71,712
Int. Cl. G01l 3/10
U.S. Cl. 73—136 A 9 Claims

The device is used to indicate torque applied by the rotary table to the drill string during drilling of oil and gas wells. Intermediate adapter between the Kelly bushing and the rotary table in one embodiment has two parts. Lower part of adapter includes standard male square drive that fits into the square drive of the rotary table, and is thus rotated by the rotary table. Upper part of adapter includes female square drive arranged to receive male square drive on the Kelly. The Kelly transmits torque from adapter assembly to the drill pipe. Upper part is connected to lower part by either hydraulic cylinders or by linkage with strain gauge. The upper part rotates with lower part, but is movable relative thereto to indicate relative torque between upper and lower parts. RF transmitter connected to the hydraulic cylinder or strain gauge provides torque signal to remote RF receiver. Alternative embodiment has unitized adapter assembly. Still another alternative embodiment uses torque sensor and RF transmitter directly on Kelly drive bushing without utilization of intermediate bushing.



3,664,185
ROTARY ACTUATOR
George M. Low, Deputy Administrator of the National Aeronautics and Space Administration with respect to an invention of; Charles Kallins, 72 Orange Drive, Jericho, N.Y., and Jerome Ostroff, 20 Ambrose Lane, Northport, N.Y.
Filed June 4, 1970, Ser. No. 43,327
Int. Cl. G01l 5/00
U.S. Cl. 73—136 R 1 Claim

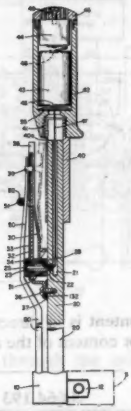


A rotary actuator particularly suited for use in environments wherein rolling and sliding friction preferably is to be avoided, such as in a high-vacuum celestial space environment, characterized by the utilization of a plurality of spaced tri-flex pivots each having a linear torque-angle characteristic over its operative range adapted continuously to support the shaft in concentric alignment within a tubular housing and an electrically energizable torquer having linear torque-current characteristics over its operating range magnetically coupled with the shaft for imposing rotation thereto for rotating the shaft against the bias of the tri-flex pivots, and an ammeter electrically coupled with said torquer for providing an output indicative of the current being supplied to the torquer and hence the angular position of the shaft.

3,664,186
TORQUE WRENCH
Robert J. Kraus, 5 Beverly Ave., Malvern, Pa.
Filed July 20, 1970, Ser. No. 56,309
Int. Cl. G01l 5/24
U.S. Cl. 73—139 2 Claims

A torque wrench is provided of the type which comprises a yieldable beam having a work-engaging head at one end and

a force-applying handle at the other end. The wrench is provided with an electrical signal circuit which preferably includes a battery and a buzzer or other signalling device, both of which may be in the handle, a reference-torque contact



and an adjustable selection-torque contact. These contacts are normally open but become closed by the bending of the yieldable beam when the selected torque force is reached, thereby actuating the buzzer or other signalling device.

3,664,187

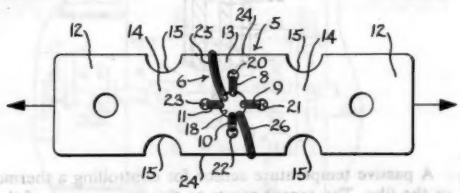
TRANSDUCER FOR MEASURING MECHANICAL FORCES

Nils Paul Goransson, Hjulsbro, Sweden, assignor to Saab-Scania Aktiebolag, Linkoping, Sweden

Filed June 3, 1970, Ser. No. 43,120

Int. Cl. G01l *1/12*

U.S. Cl. 73—141 A **6 Claims**



A transducer has a body of ferromagnetic material to which force to be measured is applied to produce, by magnetostriction, changed distribution of magnetic flux induced in the body by an a.c. energized primary embracing it. The body has a hole large enough to insure high stress concentrations upon application of force. An even number of secondaries are wound through smaller holes and around edge portions of the body. Half of the secondaries embrace zones of tension stress, the other half zones of compression stress.

3,664,188

APPARATUS FOR ACCELERATED TESTING OF THE LIGHT AND WEATHER RESISTING ABILITY OF DIFFERENT MATERIALS

Dieter Kockott, Rueckingen ueber Hanau, Germany, assignor to Original Hanau Quarzlamper GmbH

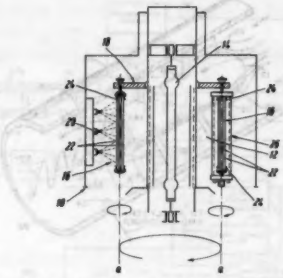
Continuation of application Ser. No. 734,770, June 5, 1968, now abandoned. This application Nov. 6, 1970, Ser. No. 87,640

Claims priority, application Germany, June 19, 1967, P 15 98 899.5

Int. Cl. G01n *17/00*

U.S. Cl. 73—150 **4 Claims**

An apparatus for accelerated testing of the radiation and atmosphere resisting ability of materials, having a radiation source and one or more gas-tight, radiation permeable containers in which material specimens may be irradiated and at



the same time exposed to selected atmospheres at super ambient pressures.

3,664,189

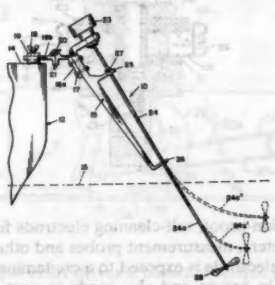
BOAT SPEEDOMETERS

Albert Weinstein, Alexandria, Va., assignor to Wellington Products, Inc., Alexandria, Va.

Filed July 14, 1970, Ser. No. 54,773

Int. Cl. G01c *21/00*

U.S. Cl. 73—185 **6 Claims**



An elongated support is either mounted or hand-held on a small boat so as to slant downwardly from the hull toward the water. A speedometer head at the upper end of the support is driven by a shaft rotatably journalled on the support. The free lower end portion of the shaft extends beyond the lower end of the support into the water and carries an impeller which is rotated by movement of the boat through water. The shaft is normally straight but its lower end portion is resiliently flexible in all directions so that the axis of rotation of the impeller is aligned with the water slipstream and drag is materially reduced.

3,664,190

FLOW METER DEVICE

Richard Brunner, Bound Brook, and Roger F. Mahon, New Brunswick, both of N.J., assignors to American Standard Inc., New York, N.Y.

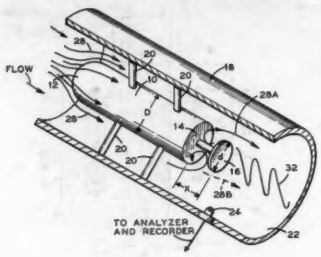
Filed Feb. 19, 1970, Ser. No. 12,797

Int. Cl. G01f *1/00*

U.S. Cl. 73—194 B **7 Claims**

The velocity of a flowing fluid is determined by means of an apparatus which includes as its principle elements, an upstream-cylinder-like element, a downstream-disc-like member spaced a short distance from the downstream end of the cylinder-like element, and means responsive to the fluid parameter fluctuations which are produced by the apparatus.

The reproducibility of the parameter fluctuation frequency versus flow rate, as well as signal strength fluctuations are improved by a system which involves the stabilization of the fluid flow by means of an asymetric design of the device.



3,664,191

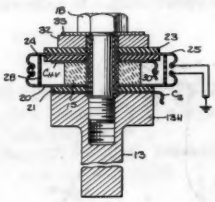
EXPLOSION-PROOF SELF-CLEANING ELECTRODES

Henry Hermanns, Huntingdon Valley, Pa., assignor to Fischer & Porter Company, Warminster, Pa.

Filed June 1, 1970, Ser. No. 42,319

Int. Cl. G01f *1/02*

U.S. Cl. 73—194 EM **5 Claims**



An explosion-proof, self-cleaning electrode for use in magnetic flowmeters, measurement probes and other instruments in which an electrode is exposed to a contaminating fluid that is explosive in nature and also tends to coat the electrode with material which interferes with its proper operation. The electrode is provided with an ultrasonic transducer to produce ultrasonic energy which is transmitted to the fluid to create cavitation effects therein, acting to clean the exposed surface of the electrode. The transducer is mounted on the electrode within a protective shield to prevent high voltage applied to the transducer from reaching the electrode and producing a spark igniting an explosive fluid.

3,664,192

DEW POINT HYGROMETERS

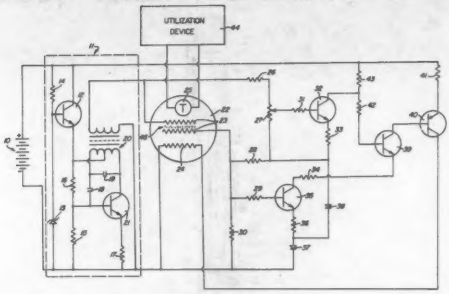
Curtis B. Campbell, and Ben L. Grover, both of Logan, Utah, assignors to Utah State University

Filed Sept. 8, 1969, Ser. No. 856,037

Int. Cl. G01n *25/66*

U.S. Cl. 73—336.5 **8 Claims**

The invention disclosed herein relates to the measurement of the water vapor content of a gaseous environment and more particularly to the measurement of the water vapor content of the atmosphere by means of a hygroscopic salt exposed to the atmosphere. The salt absorbs moisture from, or releases moisture to, the atmosphere as a function of the water vapor content of the atmosphere and the temperature to which the salt is heated. Heat is supplied to the hygroscopic salt to a greater or lesser degree in response to changes in the resistivity of the salt and these changes in resistivity are relatively large with relatively small variations in the amount of water absorbed by the salt at its lower percentages of water absorption. The temperature required to maintain the hygroscopic salt at its preselected resistivity and resultant low degree of water content is in direct relationship to the dew point or water vapor content of the atmosphere.



3,664,193

PASSIVE TEMPERATURE SENSOR

Peter V. Nielsen, Nordborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Filed Apr. 22, 1970, Ser. No. 30,891

Claims priority, application Germany, Apr. 28, 1969, P 19 21 570.4

Int. Cl. G01k *5/08, 5/10*

U.S. Cl. 73—368 **19 Claims**

A passive temperature sensor for controlling a thermostat or the like. The sensor reacts to the temperature of the air and also to thermal radiation in order to control a thermostat in such a manner to give optimum personal comfort despite relative changes over a period of time between the room air temperature and thermal radiation effects in the room.

3,664,194

VALVE ASSEMBLY FOR INJECTING A LIQUID SAMPLE INTO AN ANALYZING INSTRUMENT

Ormond E. Barstow, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

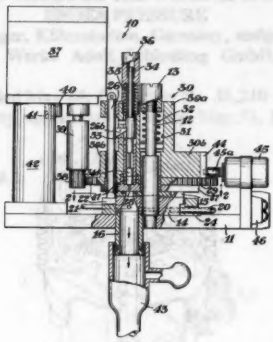
Filed Sept. 29, 1970, Ser. No. 76,556

Int. Cl. G01n *1/10*

U.S. Cl. 73—422 GC **5 Claims**

A valve assembly is provided which comprises basically a stationary base and a slidable body member, the unit being attached to an analyzing instrument. The base includes a passageway for conducting a liquid stream to be analyzed, such as water, into the valve assembly. The slidable member includes a plunger or piston slidably carried in a chamber and an orifice which communicates with the chamber. At one point during sliding contact of the body member with the stationary base, the orifice is aligned with the passageway. At a later point the orifice lines up with a discharge port in the base which communicates with the analyzing instrument. As the orifice lines up with the passage the plunger is actuated to withdraw a precise amount of liquid sample into the

chamber through the orifice. When the orifice lines up with the discharge port the plunger is again actuated to "shoot"



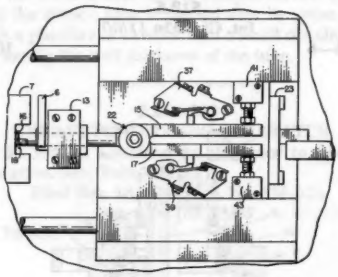
the sample downwardly through the orifice and into the analyzing instrument.

3,664,195

ARTICLE TESTING APPARATUS

Daniel Fournier, Roseville, and Urho A. Strang, Livonia, both of Mich., assignors to Dan Bee Corporation, Southfield, Mich.

Filed May 11, 1970, Ser. No. 35,968
Int. Cl. G07c *5/06*
U.S. Cl. 73—432 R **6 Claims**



An apparatus for detecting missing threads in internally threaded nuts. A scissor-like probe element is translated into the internally threaded hole of the nut and travels the full length of the nut. If any threads are missing, the probe fingers will expand and energize a reject solenoid to eject the improperly fabricated nut. The probe unit is actuated by a spring-loaded slide driven by a gear reduction motor and a bellcrank wheel. A missing thread gives rise to a pivotal motion of one of the probe elements, and this motion is detected by an adjacent electrical contact detecting device. The testing operation is completely automatic and the stopping and starting of the probe unit may be controlled by a parts detection switch mounted in a track in front of the probe unit.

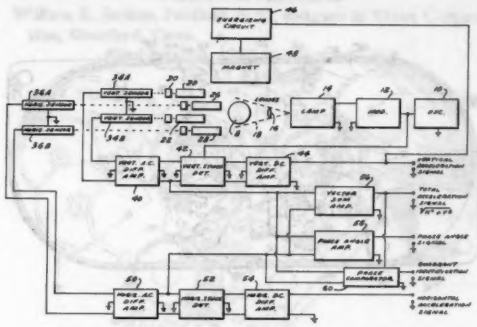
3,664,196

ACCELEROMETER

Jorge G. Codina, 223 Secor Road, Hartsdale, N.Y.

Continuation-in-part of application Ser. No. 710,155, Mar. 4, 1968. This application July 31, 1970, Ser. No. 59,919
Int. Cl. G01p *15/08*
U.S. Cl. 73—517 B **7 Claims**

An accelerometer for measuring the acceleration of a body in any direction with extremely high sensitivity and accuracy, utilizing a mass which is free to move incrementally in any direction but which is then returned to a stable position by means of a servo-controlled electromagnetic field.

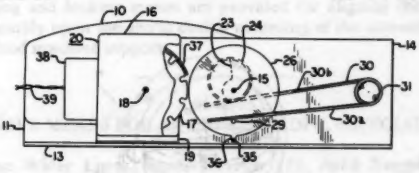


3,664,197

CONSTANT TORQUE DEVICE FOR METER READING SYSTEM

Elmer L. Larsen, Greenfield, Wis., assignor to McGraw-Edison Company, South Milwaukee, Wis.

Filed Feb. 12, 1971, Ser. No. 115,005
Int. Cl. F16h *27/04*
U.S. Cl. 74—1.5 **17 Claims**



A meter output shaft drives a constant torque device. The constant torque device drives a disc encoding assembly that produces an output indicating the quantity measured by the meter. The constant torque device has a drive dog and eccentric cam assembly rotated by the meter shaft. The drive dog rotates to drive a freely rotating plate through a drive pin on the plate. A double arm spring is positioned to have one spring arm bias against the eccentric cam and the other spring arm against a toggle pin on the plate. On rotation of the shaft, the dog is rotated to move the plate drive pin during a half revolution of the shaft against the biasing of the second spring arm until an overtoggle position is reached at which time the second spring arm shifts the plate 180°. Upon shifting of the plate, a disc toggle pin on the plate drives the disc to change the reading on the disc encoder assembly. Upon overtoggling of the plate, the shaft continues to rotate the eccentric cam against the bias of the first spring arm during the other half revolution of the shaft until the drive dog again engages the plate drive pin.

3,664,198

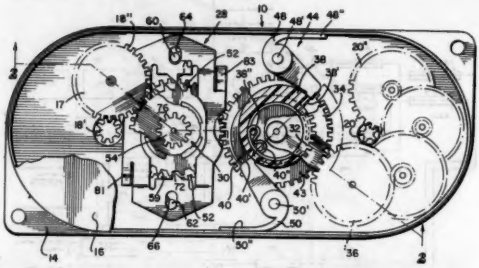
DRIVE MEANS WITH VARIABLE OUTPUTS

Benjamin F. Chestnut, Greenwood, and Richard W. Stafford, Clayton, both of Ind., assignors to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Filed June 29, 1970, Ser. No. 50,703
Int. Cl. F16h *5/74*
U.S. Cl. 74—3.54 **15 Claims**

There is provided a combination constant speed output means and an intermittent drive means, both rotatably car-

ried by a shaft and responsive to rotation of a gear reduction means, second output means responsive to movement of the intermittent drive means and dampening means cooperating with the second output means to retard the snap action characteristics generated by the intermittent drive means.



3,664,199

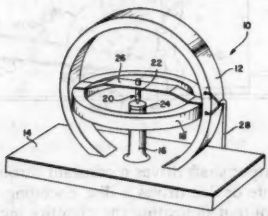
BRUSHLESS D.C. MOTOR DRIVEN GYROSCOPE

Reinhard N. Lahde, Los Altos, Calif., assignor to Lockheed Aircraft Corporation, Burbank, Calif.

Filed Jan. 12, 1970, Ser. No. 2,066

Int. Cl. G01c *19/28*

U.S. Cl. 74—5.6 **11 Claims**



An electrical gyroscope having an annular electromagnetic field structure and a magnetic rotor gimbaled within the field structure in such a way that the gimbal support carries only the rotor and not the field structure. The field structure is connected to a D.C. source through a switching circuit which intermittently energizes the field structure in the proper timing to drive the rotor at a high spin rate with a brushless D.C. motor action.

3,664,200

STABLE BASE MOUNTS

Hendrik Ter Brugge, Hengelo, Netherlands, assignor to N.V. Hollandse Signaalapparaten, Hengelo (O), Netherlands

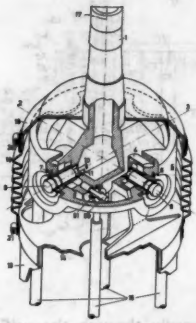
Filed Apr. 28, 1970, Ser. No. 32,700

Claims priority, application Netherlands, May 8, 1969, 6907029

Int. Cl. G01c *19/46*

U.S. Cl. 74—5.22 **11 Claims**

In a ship-born stable base mount is a hollow column secured in a position perpendicular to the deck plane of the ship. Means are presented for mounting a Gimbal system including two orthogonal axes on the upper end portion and a gyroscopically controlled servo drive system on the lower end portion of the hollow column. Furthermore, the stable base mount comprises transmission means controlled by the servo drive system and extending through the length of the interior of the hollow column to act on a base member to be stabilized.



3,664,201

STARTER DRIVE FOR COMBUSTION ENGINES

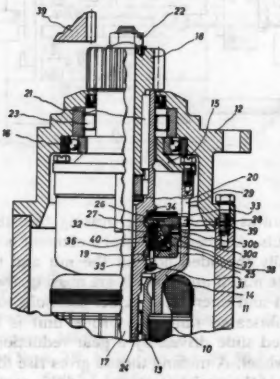
Erich Vogel, Bernhausen, and Gunther Ullmann, Schwieberdingen, both of Germany, assignors to Robert Basch GmbH, Stuttgart, Germany

Filed Oct. 16, 1970, Ser. No. 81,348

Claims priority, application Germany, Nov. 11, 1969, P 19 56 518.5

Int. Cl. F02n *11/00*

U.S. Cl. 74—6 **10 Claims**



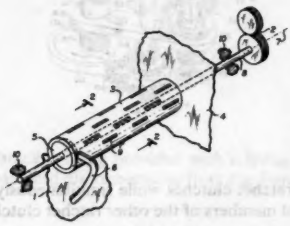
An axially shiftable rotatable rod is mounted with radial clearance in the hollow output shaft of a motor. A pinion is fixed on the rod and at least in part located outwardly beyond the shaft so that it can mesh with a gear of a combustion engine to be started. A sleeve surrounds the rod fixed with the pinion and has an outer steep-pitch thread. A motion-transmitting coupling is provided including a first coupling element mounted in the shaft for rotation therewith and a second coupling element carried by the sleeve for rotation therewith. The coupling elements are provided with mechanically interlockable coupling projections and damping means is located between the sleeve and the first coupling portion and serves for damping axially directed forces.

3,664,202

APPARATUS FOR THE TRANSMISSION OF A ROTARY MOVEMENT THROUGH THE WALL OF A CHAMBER UNDER PRESSURE

Reinhold Metzger, Kilianstadten, Germany, assignor to VDO Tachometer Werke Adolf Schindling GmbH, Frankurt, Germany

Filed May 18, 1970, Ser. No. 38,210
Claims priority, application Germany, May 31, 1969, P 19 278 42.3
Int. Cl. F16J *15/50*
U.S. Cl. 74—18.1 7 Claims



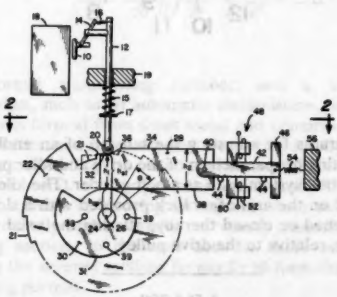
An apparatus for the transmission of an oscillatory movement through the wall of a chamber under pressure, comprising a torsion tube having one open end and secured pressure tight in a corresponding recess of a wall and the other end being closed up pressure tight. A shaft is disposed concentrically in the torsion tube and is secured to the closed tube end, and the torsion tube is formed over its entire outer surface with a plurality of cavities with a small opening face and reduces locally the wall thickness of the tube.

3,664,203

SHAFT POSITIONING APPARATUS

Andrew B. Pataki, Lansdale, Pa., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Dec. 18, 1969, Ser. No. 886,226
Int. Cl. F16h *25/08*
U.S. Cl. 74—55 6 Claims



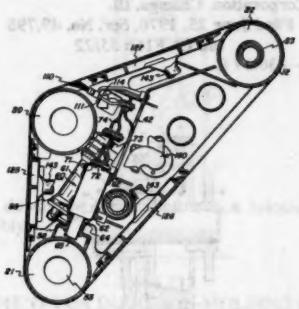
Shaft positioning apparatus including a spiral cam in supporting relation to an interposer cam which, by moving perpendicular to the axis of the shaft, lifts the shaft from contact with a shaft-supporting and positioning stepped cam. The stepped cam and the spiral cam are mounted on a common drive member and have a substantially constant difference in radial length at any angular position so that the interposer cam can lift the shaft regardless of the orientation of the stepped cam.

3,664,204

BELT ASSEMBLY FOR USE IN AN ELECTROSTATIC PRINTING MACHINE

William E. Jordan, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 29, 1970, Ser. No. 102,464
Int. Cl. F16h *7/00*
U.S. Cl. 74—219 4 Claims



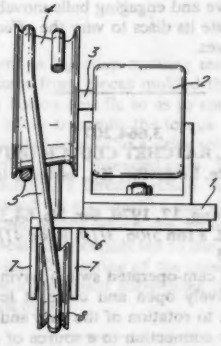
A multiple roller belt assembly module arrangement for an electrostatic printing machine of the type employing an endless photoconductive belt. The arrangement supports the module in cantilever fashion using two horizontally protruding shafts one of which is rotatably driven and connected to one roller for driving the belt and the other being fixed. Centering and locking means are provided for aligning the belt assembly upon the shafts during mounting of the assembly to a fixed machine support.

3,664,205

DRIVE MEANS FOR AN ENDLESS ROPE, ESPECIALLY FOR SKI LIFTS

Arne Widar Luras, Sandsvaerveien 151, 3600 Kongsberg, Norway

Filed Aug. 26, 1970, Ser. No. 66,999
Claims priority, application Norway, Aug. 30, 1969, 3478/69
Int. Cl. F16h *7/04*
U.S. Cl. 74—224 3 Claims



A drive means for small portable ski lifts comprises a flanged motor-driven drive drum mounted at the upper station of the ski lift and frictionally driving an endless smooth rope adapted to be gripped by the skiers. The incoming reach of the rope passes around the drive drum in a first turn, then around an idle roller and finally in a second turn around the drive drum before leaving the drum. The drive drum is conical and the idle roller separated said turns is positioned radi-

ally outside the position on the circumference of the drum at which the incoming reach enters the drum and in approximately the same plane as the part of the conical drum having the smaller diameter.

3,664,206

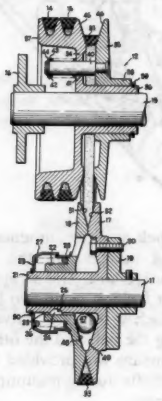
ACCESSORY DRIVE MECHANISM

Julius A. Clauss, Jr., Birmingham, Mich., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed June 25, 1970, Ser. No. 49,795

Int. Cl. F16h *55/22*

U.S. Cl. 74—230.17 E **9 Claims**



A drive mechanism for driving accessories, associated with a prime mover such as an automotive engine which is normally operated over a wide range of speeds, and operable to increase the speed of the accessories at lower engine speeds to increase their output and to reduce the speed of the accessories at high engine speeds. The drive mechanism is a speed-responsive variable ratio V-belt pulley assembly with expanding driving and driven pulleys, each pulley having truncated conical discs defining a V-belt groove and movable toward each other by spring force, the drive pulley being rotatable by the engine and provided with cam ramps disposed radially inward of its groove and engaging balls movable by centrifugal force to separate its discs to vary the effective diameters of the V-belt grooves.

3,664,207

DUAL RATCHET CLUTCH DRIVE

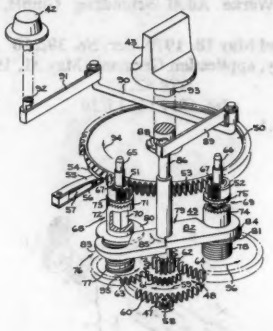
Frederick M. White, Louisville, Ky., assignor to General Electric Company

Filed Aug. 17, 1970, Ser. No. 64,331

Int. Cl. F16h *5/06, 3/10*; F16d *41/00*

U.S. Cl. 74—337.5 **3 Claims**

A motor-driven cam-operated switch having a rotary cam adapted to selectively open and close at least one switch means in response to rotation of the cam and having a drive motor adapted for connection to a source of electrical energy, is provided with a two-speed drive train adapted to selectively transmit low or high speed rotational motion to the rotary cam. The drive train includes first and second ratchet clutches and drive means adapted to connect each of the clutch inputs to the drive motor and to connect each of the clutch outputs to the rotary cam such that the first clutch may be operative to drive the rotary cam at high speed and the second clutch may be operative to drive the cam at low speed. Each of the ratchet clutches may include a toothed input member and a toothed output member. A shifting means is provided to selectively engage the toothed member



of one of the ratchet clutches while simultaneously disengaging the toothed members of the other ratchet clutch.

3,664,208

APPARATUS FOR ADJUSTING THE POSITION OF THE AXIS OF A BELT SUPPORTING PULLEY

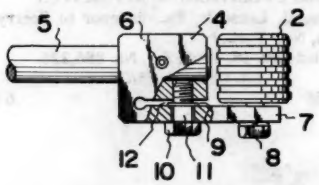
Noboru Saito, Tokyo, Japan, assignor to Nitto Kohki Company Limited, Tokyo, Japan

Filed Jan. 27, 1971, Ser. No. 110,096

Claims priority, application Japan, Dec. 10, 1970, 45/35657

Int. Cl. F16h *7/10*

U.S. Cl. 74—242.15 **5 Claims**



An apparatus for adjusting the tension of an endless belt and correcting for parallelism of the drive and idler pulleys in an endless belt system such as a belt grinder. The idler pulley is mounted on the arm of a block provided with a slot which can be opened or closed thereby, altering the axial position of the idler, relative to the drive pulley.

3,664,209

APPARATUS FOR ATTACHING A STEERING HANDLE TO A TWO-WHEEL VEHICLE

Masayuki Michiuchi, Hamamatsu, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 8, 1970, Ser. No. 70,076

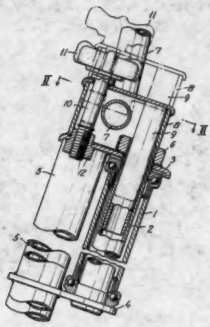
Claims priority, application Japan, Apr. 4, 1970, 45/31903

Int. Cl. B62k *21/24*

U.S. Cl. 74—551.3 **8 Claims**

An apparatus for attaching a steering handle in a two-wheel vehicle comprises a handle post secured to a bracket

supporting a steering handle, the handle post being rotatably and removably attached to a steering stem within a head



pipe, the bracket being provided with a fixing member connectable with and disconnectable from the front wheel fork.

3,664,210

TRANSMISSION MECHANISM AND METHOD OF MANUFACTURE THEREOF

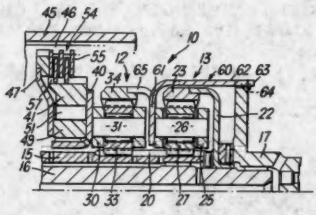
James Morrison Laing, Letchworth, England, assignor to Borg-Warner Limited, Letchworth, England

Filed July 17, 1970, Ser. No. 55,771

Claims priority, application Great Britain, July 29, 1969, 38,121/69

Int. Cl. F16h *57/00*; B21d *51/00*

U.S. Cl. 74—753 **10 Claims**



A torque transmitting member, and a transmission mechanism, such as an automatic transmission, in which the member is formed from sheet metal and comprises a central radial portion and forwardly and rearwardly axially extending portions connecting the member to elements of two planetary gear sets and to a torque transmitting shaft. The member may be formed by drawing an annular sheet metal part to form a radially and an axially rearwardly extending portion, severing sections in the area between these portions and bending the severed sections forwardly to form the forwardly extending portion.

3,664,211

VEHICLE DOOR LOCK RELEASE METHOD AND APPARATUS

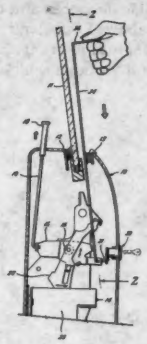
John S. McConnell, 6242 Longmont, Houston, Tex.

Filed Oct. 15, 1970, Ser. No. 80,832

Int. Cl. E05b *19/20*

U.S. Cl. 81—3 R **4 Claims**

An elongate member arranged for downward insertion into a vehicle door between the door glass and window sill and arranged to engage a portion of the door lock assembly and trip the lock. Means are provided for exerting either an upward or a downward force upon a lock release arm of the lock assembly.



3,664,212

ATTACHMENT FOR INJECTION-MOLDING MACHINES

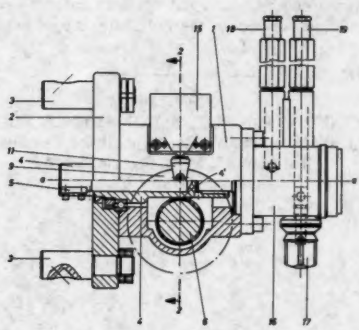
Karl Hehl, Siedlung 183, 7291 Lossburg, Wuttenberg, Germany

Filed Dec. 8, 1970, Ser. No. 96,215

Claims priority, application Germany, Dec. 13, 1969, P 19 62 663.2

Int. Cl. B25b , *17/00, 21/00*

U.S. Cl. 81—52.5 **8 Claims**



An attachment to injection-molding machines for removing threaded cores from pieces molded therein has a motor connected to a hollow spindle so as to rotate the same. The hollow spindle either transmits the torque from the motor to at least one threaded core or to a drive spindle which in turn transmits the torque to a threaded core. The spindle has an outer surface defining a thread section. A stationary switch element is provided for a respective one of a pair of adjustable switching cam means which are arranged on the outer periphery of a scale disc connected to the hollow spindle for rotation therewith. The setting of the cams via the cooperation with the switch element determines the start and finish of a core removal cycle.

3,664,213

WRENCH

Reuven Anati, Mazkereth Batya, Israel

Filed Sept. 10, 1970, Ser. No. 71,161

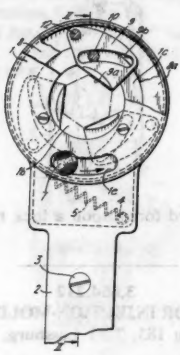
Claims priority, application Israel, Sept. 11, 1969, 32989

Int. Cl. B25b *13/28, 13/18*

U.S. Cl. 81—91 R **6 Claims**

A wrench for nuts, bolts or pipes which consists of a shallow housing having a throughgoing circular axial opening, an

annulus adapted to rotate within the housing around the axis of said opening, at least two pins being fixed to said annulus spaced at equal angular distances and constituting pivots for a corresponding number of substantially flat jaw members whose jaw faces extend into the range of said openings. Each jaw member has a slot through which a guide pin fixed to



said housing extends. When the annulus is turned, the jaw members describe a guided movement, whereby their faces approach or move away from the axis of the opening. A handle provided on the housing is apt by a ratchet-like movement to tighten or loosen the bolt, nut or pipe held by the jaws.

3,664,214

COMBINATION PLIERS AND WRENCH TOOL

Reuben J. Feldman, 188 W. Randolph Street, Chicago, Ill.

Filed Mar. 18, 1970, Ser. No. 20,644

Int. Cl. B25b *13/12*

U.S. Cl. 81—130 **2 Claims**

A hand operative tool comprising a pair of handle grip members, one of which has a fixed jaw, the other handle grip member being adjustably attached to a moveable jaw, the handle grip members being slideable relative to each other so that the fixed and moveable jaw allow for maximum pressure to be applied to fasteners, fittings and the like.

3,664,215

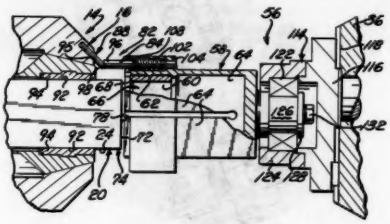
MACHINE TOOL WITH BAR STOCK GRIPPER

Jack H. Selby, Chagrin Falls, Ohio, assignor to The Warner & Swasey Company, Cleveland, Ohio

Filed June 11, 1970, Ser. No. 45,477

Int. Cl. B23b *13/02*

U.S. Cl. 82—2.5 **16 Claims**



An improved machine tool includes a spindle for rotating bar stock which has a noncircular cross sectional configuration. A bar stock feed gripper is engageable with a leading end portion of the bar stock and is movable away from the spindle to pull bar stock to a machining station. Positioning members mounted on the spindle and gripper cooperate to orient clamping surfaces on the gripper in proper alignment with the noncircular bar stock. To orient the gripper clamping surfaces, the positioning member on the gripper is moved into a path of rotation of the positioning member on the spindle as the gripper is moved toward the leading end portion of the bar stock. When the spindle rotates its positioning member into abutting engagement with the positioning member on the gripper, the gripper clamping surfaces are in the desired alignment with the noncircular bar stock.

3,664,216

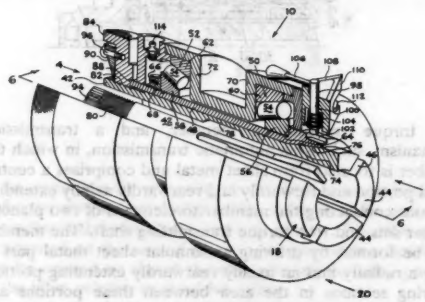
SELF-CENTERING STEADY REST CHUCKS

Joseph Kladich, 100 Rowena Drive, Don Mills, Ontario, Canada

Filed June 14, 1968, Ser. No. 737,071

Int. Cl. B23b *25/00*

U.S. Cl. 82—38 **5 Claims**



A steady rest for use with a lathe has a non-rotatable housing which is suitably secured to the lathe and which supports for rotation therein a self-centering chuck for securing a work-piece extending through the steady rest. The collet member of the chuck has axially extending fingers which are radially flexed or released respectively to engage or disengage the workpiece on relative axial movement of such collet member and a sleeve surrounding that member, by virtue of the provision of co-operating frusto-conical surfaces on said collet member and said sleeve. An internally threaded adjusting collar engages a corresponding thread on the collet member and abuts the end of the sleeve, so that the collet

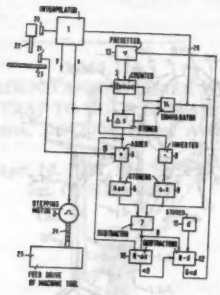
member is moved axially and the collet fingers move radially when the adjusting collar is rotated relative to the collet member. A pin is radially retractably mounted through the housing for releasable engagement with the sleeve to hold such sleeve stationary and to facilitate tightening or releasing of the collet fingers on the workpiece. A ratchet and pawl mechanism is provided between the adjusting collar and the collet member to prevent their relative rotation and loosening of the collet fingers from the workpiece during operation of the lathe.

3,664,217

METHOD AND SYSTEM FOR DIGITAL SUBDIVISION OF THE TOOL FEED TRAVEL OF A NUMERICALLY CONTROLLED MACHINE TOOL

Peter Schiewek, Eltersdorf, and Dieter Kremper, Erlangen, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin, Munich, Germany

Filed Feb. 24, 1970, Ser. No. 13,662
Claims priority, application Germany, Mar. 1, 1969, P 19 10 577.2
Int. Cl. B26d *3/00*; B23d *27/00*
U.S. Cl. 83—49 **3 Claims**



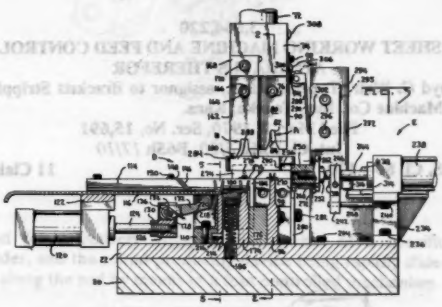
The tool feed travel of a numerically controlled machine tool is subdivided into steps of approximately equal lengths by sequentially adding after one of the first steps the length (Δs) of the respective next following steps to obtain each time the sum total ($n\Delta s$) of the number (n) of steps already performed, comparing each of the sum totals thus counted with the then still remaining feed travel ($s-x$), and shortening the length of the subsequent steps a given amount (ν) until the difference between the still remaining feed travel ($s-x$) and the sum total ($n\Delta s$) declines below a given minimum (d) between 50 and 100 percent, preferably between 60 and 70 percent, of the normal step length. The method is performed with the aid of a logic system in which a pulse generator, preferably an interpolator, issues to a pulse counter a number of pulses during each tool-feed step, this number being indicative of the pulse length. Logic components compare the counted sum total with a number originally set to the total feed travel and progressively reduced in accordance with the feed travel already performed. When the comparison results in a difference smaller than a given minimum, the output of the logic system resets the pulse counter by a given amount which shortens the subsequent travel steps until the difference declines below the above-mentioned minimum.

3,664,218

METHOD AND APPARATUS FOR FORMING AN INSULATED ELECTRICAL CONNECTION

Ralph Rupp Lau, Harrisburg, Pa., and Gilbert Carl Sitz, Richardson, Tex., assignors to AMP Incorporated, Harrisburg, Pa.

Original application Sept. 23, 1965, Ser. No. 489,558, Pat. No. 3,386,153.
Divided and this application Sept. 17, 1970, Ser. No. 73,060
Int. Cl. B26d *7/06*
U.S. Cl. 83—81 **2 Claims**



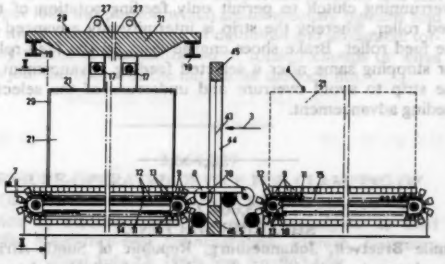
An apparatus is provided for forming an insulated electrical connection. An electrical terminal having an open U-shaped ferrule-forming portion is fed to a first crimping station. The stripped end of an insulated electrical conductor is inserted into the ferrule-forming portion and the terminal is crimped to the conductor. An open U-shaped insulating member is fed to a second crimping station. The terminal and conductor previously joined are transferred to the second crimping station in overlying relationship with the insulating member. The insulating member is then crimped around the terminal and conductor.

3,664,219

APPARATUS FOR CUTTING A BLOCK OF PLASTIC MATERIAL

Berend Vrijma, Vuren, Netherlands, assignor to Calsilox S.A., Luxemburg Ville, Luxembourg

Filed June 23, 1970, Ser. No. 49,050
Claims priority, application Netherlands, June 26, 1969, 6909801
Int. Cl. B28b *7/14*
U.S. Cl. 83—89 **11 Claims**



Apparatus for cutting a block of material in a plastic state, more particularly light weight concrete, comprising a plurality of supports which extend transversely of a cutting direction and whose upper surfaces are formed with a plurality of projections; a plurality of rods extending in the cutting direction and loosely spaced out one beside the other between the projections, for carrying the block; and a

number of cutting wires. The parts of the block disposed at a cutting wire width from one another cannot be pushed against one another, as is needed for cutting the parts of the block in a direction transverse of the cutting already performed, to prevent the tearing and crumbling of the parts of the block during the second cutting.

This apparatus is improved in that the supports adjoin one another, and the projections and the rods are substantially of the same height and cooperate to form a flat table.

3,664,220

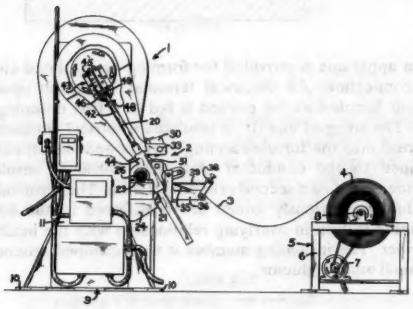
SHEET WORKING MACHINE AND FEED CONTROL APPARATUS THEREFOR

Boyd C. Blair, Topeka, Kans., assignor to Brackett Stripping Machine Co., Inc., Topeka, Kans.

Filed Mar. 2, 1970, Ser. No. 15,691

Int. Cl. B26d *5/20*; **B65h** *17/10*

U.S. Cl. 83—170 **11 Claims**



A high speed sheet working machine and a feed control apparatus therefor which is operative to precisely control the amount of material to be cut from a strip, fed from a roll, to form sheets with edges thereof in precise registry, as if stacked and trimmed all at one time. The feed control apparatus holds the strip in firm engagement with a feed roller which is rotatably mounted on a drive shaft engaged by an overrunning clutch to permit only feeding rotation of the feed roller, whereby the strip is intermittently advanced by the feed roller. Brake shoes engage discs on the feed roller for stopping same after a selected feeding advancement of the strip to avoid overruns and underruns of the selected feeding advancement.

3,664,221

SHEARING MACHINES

Emile Breetvelt, Johannesburg, Republic of South Africa, assignor to Intermenua (Proprietary) Limited, Johannesburg, Republic of South Africa

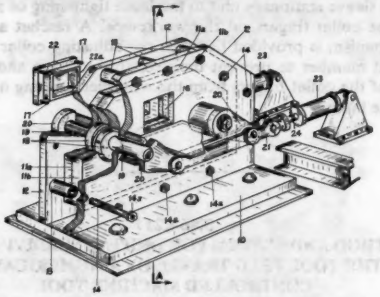
Filed May 5, 1970, Ser. No. 34,754

Claims priority, application South Africa, May 7, 1969, 69/3272

Int. Cl. B23d *15/00, 23/00*

U.S. Cl. 83—196 **9 Claims**

A metal shearing machine in which two cooperating die carriers which, may optionally have dies made integral therewith, are mounted in a supporting stand therefor, the die carriers being associated with means for moving them in parallel planes simultaneously but in directions substantially at right angles to each other.



3,664,222

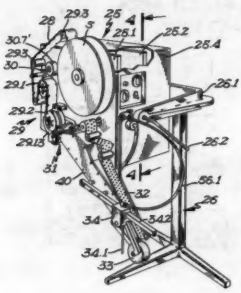
LABELING MACHINE

Judson H. Early, Dallas, Tex., assignor to Domain Industries, Inc., New Richmond, Wis.

Filed Apr. 7, 1970, Ser. No. 27,055

Int. Cl. B26d *5/22*

U.S. Cl. 83—205 **17 Claims**



A labeling machine; the labels being drawn from a roll of labels in strip form, then fed and cut precisely, and being vacuum carried and heated for adhesive activation and application to the article upon command. The alternate label feeding and cutting being effected by the alternate retraction and extension strokes of a reciprocating air motor, and mechanical interlocks prohibiting cutting until feeding is complete and prohibiting partial cycling through hand operation.

3,664,223

SELF-ALIGNING SLITTING APPARATUS FOR TRAVELING WEBS

Charles E. Brocklehurst, Augusta, Ga., assignor to Riegel Textile Corporation, Ware Shoals, S.C.

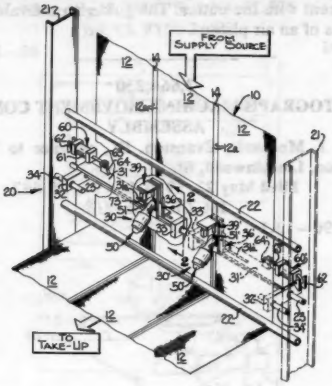
Filed Apr. 8, 1970, Ser. No. 26,508

Int. Cl. B26d *5/04*

U.S. Cl. 83—368 **3 Claims**

An apparatus for slitting a longitudinally traveling elongate web having both longitudinally extending thickened and thinned portions joining each other at one longitudinal side edge of the thickened portion and being characterized by its ability to self-align to compensate for deviations in the path of travel of the one longitudinal side edge. A sensing means and severing means are mounted for transverse movement with each other with the sensing means being disposed for al-

ternative engagement with the thickened and thinned portions and with the severing means being disposed for longitudinally slitting the traveling web along a predetermined path. A reciprocating means is provided for continuously shifting the sensing means and severing means in alternative opposite



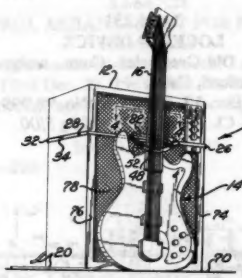
transverse directions and is controlled by control means responsive to the sensing means for actuating the reciprocating means to transversely shift the sensing means and severing means to continually compensate for deviations in the path of travel of the one longitudinal side edge of the thickened portion.

3,664,224

MAIN STRAP AROUND AN AMPLIFIER WITH HOLDING STRAP TO HOLD GUITAR

James V. Campagna, Jr., 2008 Magee Avenue, Lakewood, Ohio

Filed Apr. 14, 1971, Ser. No. 133,995
Int. Cl. G10h *1/00*
U.S. Cl. 84—1.01 **8 Claims**



An improved guitar support assembly includes a main strap assembly which encircles an amplifier. The main strap assembly has an elastic section to provide for tight engagement between the strap assembly and amplifiers of different dimensions. A holding strap is connected with the main strap assembly and releasably engages the neck portion of a guitar to hold the guitar in an upright position when it is not being played.

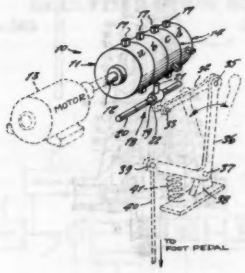
3,664,225

VARIABLE ELECTRIC METRONOME

Walter C. Robertson, P.O. Box 1292, San Marcos, Tex.

Filed Mar. 18, 1970, Ser. No. 20,488
Int. Cl. G04f *5/02*
U.S. Cl. 84—484 **3 Claims**

A metronome for indicating musical tempo, the device comprising a series of cylinders mounted on a shaft that is driven by an electric motor, each of the cylinders having a radially outwardly extending spoke or several spokes adaptable to strike a sound producing device that is slideable along



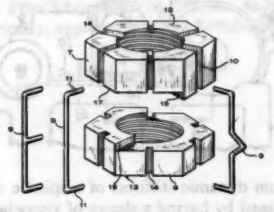
a rod for selectively engaging the spokes of a specific cylinder, and the sound-producing device being rapidly slideable along the rod by means of a foot controlled mechanism.

3,664,226

NUTS AND LOCK NUTS COUPLED IN ONE SINGLE UNIT FOR TIGHTENING AT A CONTROLLED TORSION

Cesar Fernandez-Veraud Gonzalez, Avenue Central 58, Mexico City, Mexico

Filed June 12, 1970, Ser. No. 45,760
Int. Cl. F16b *31/02, 39/12*
U.S. Cl. 85—61 **3 Claims**



Improvements on nuts and lock nuts characterized by their being threaded in one single unit and comprising two separate pieces namely: a lower nut portion properly said and an upper lock nut portion which simultaneously tightens said lower nut portion to a degree of delimited and adjustable torsion by means of the utilization of torsion clamps or wires which join the bodies of the nut and of the lock nut.

3,664,227

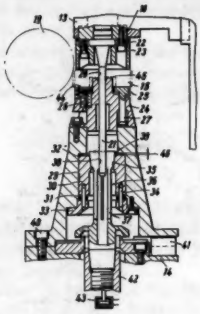
PRESSURE-OPERATED DEVICE FOR CLAMPING OF WORKPIECES ON GEAR PROCESSING MACHINES

Heinrich R. Fischer, Munich, Germany, assignor to Carl Harth, Maschinen-und Zahnradfabrik, Munich, Germany

Filed July 22, 1969, Ser. No. 843,650
Claims priority, application Germany, July 30, 1968, P 17 52 877.7
Int. Cl. B23f *23/06*
U.S. Cl. 90—1 **12 Claims**

A device for clamping workpieces on gear processing machines in which a drawbar is driven axially to pull to workpiece onto a workpiece support. A resilient collet is secured to a drawbar and has an outer cone for engaging a draw-in arbor to permit the drawbar to apply an initial pressure on

the workpiece when the drawbar is pulled toward a workpiece support. The collet is received by a countercone which



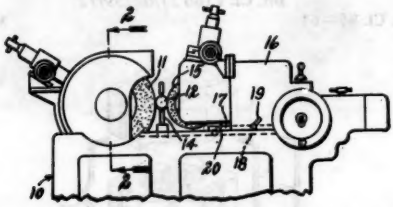
resiliently yields to the pull of the drawbar to permit the drawbar to apply a final clamping pressure to the workpiece.

3,664,228

DAMPING MEANS FOR INCREASING THE MINIMUM DYNAMIC STIFFNESS OF A SHAFT

John R. Hasz, Cincinnati, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Sept. 11, 1969, Ser. No. 857,155
Int. Cl. B23c *9/00*
U.S. Cl. 90—11 A **24 Claims**



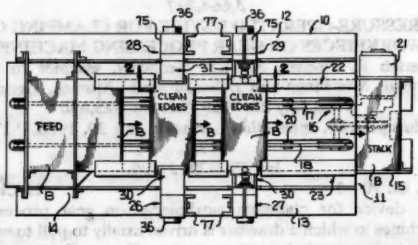
The minimum dynamic stiffness of a spindle of a grinding wheel is increased by having a sleeve of viscoelastic material bonded to the spindle between the bearing supports for the spindle. A sleeve surrounds the viscoelastic material sleeve to constrain the sleeve of viscoelastic material to increase its shear strains and is bonded thereto.

3,664,229

CONTROLLED CUTTING FORCE ASSEMBLY

John T. Cary, Markham, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Filed Jan. 12, 1970, Ser. No. 2,290
Int. Cl. B23c *3/12*
U.S. Cl. 90—18 **10 Claims**



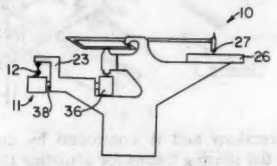
This disclosure relates to an apparatus for cleaning edges of sheet metal can body blanks prior to welding. The cleaning is accomplished by means of high speed cutters. In order to assure a uniform abrading or cutting action without the wearing of the cutters becoming a factor, a special guide is associated with each cutter for deflecting an edge portion of a sheet metal blank being cleaned into controlled pressure engagement with the cutter. The guide is preferably actuated by means of an air piston.

3,664,230

PANTOGRAPH MACHINE MOVEMENT CONTROL ASSEMBLY

Bernard I. Mechanic, Evanston, Ill., assignor to Tiara Corporation, Lincolnwood, Ill.

Filed May 22, 1970, Ser. No. 39,642
Int. Cl. B23c *1/18*
U.S. Cl. 90—13.1 **6 Claims**



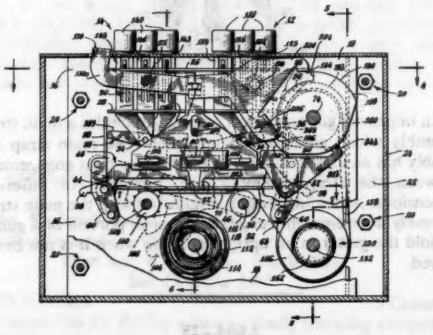
Pantograph machine movement control assembly in which relative rotational movement of cutter and work supports about a certain axis is effected in proportion to an X component of movement of a tracing stylus while relative rectilinear movement of the supports is effected in proportion to a Y component of movement of the stylus to cause a cutting portion of a cutter to move through work on the work support in a linear path along a certain line which intersects the certain axis at an acute angle. The assembly is especially advantageous when used for the cutting of letters on the bezel portion of a class ring or the like.

3,664,231

LOCKING DEVICE

Walter J. Hanson, Old Greenwich, Conn., assignor to Pitney-Bowes, Inc., Stanford, Conn.

Filed Dec. 17, 1970, Ser. No. 98,999
Int. Cl. E05b *37/16;* **G05g** *5/00*
U.S. Cl. 70—292 **22 Claims**



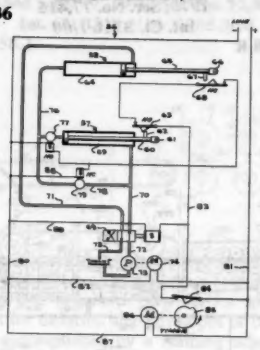
There is disclosed a combination lock which is actuated by two sets of numbered keys. Contained within the lock is a tape which is pre-punched with a succession of randomly generated codes. The lock can be actuated only when the keys punched by the user correspond with the code on the punched tape. Each actuation of the lock advances the tape to establish a new code.

3,664,232

DRIVE SYSTEM

Miro Dvirka, Long Island City, N.Y., assignor to Hagan Industries Incorporated, Corona, N.Y.

Division of Ser. No. 821,560, May 1, 1969, Pat. No. 3,585,947.
Filed Aug. 5, 1970, Ser. No. 61,328
Int. Cl. F15b *21/02*
U.S. Cl. 91—36 16 Claims



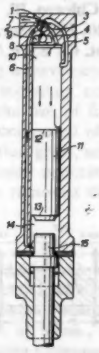
A drive system generally including a first fluid cylinder assembly, a second fluid cylinder assembly, first means for supplying fluid under pressure to the front end of the first fluid cylinder assembly, second fluid supply means for supplying fluid to the front end of the second fluid cylinder assembly, the first and second fluid supply means being communicable with a source of fluid under pressure, means for selectively communicating the first and second fluid supply means with the source of fluid under pressure, means intercommunicating the rear ends of the fluid cylinder assemblies, and means communicable with the source of fluid under pressure for selectively supplying fluid under pressure to the rear end of the first fluid cylinder assembly while closing said means intercommunicating the rear ends of said fluid cylinder assemblies.

3,664,233

CONTROL ARRANGEMENT FOR PNEUMATIC HAMMERS

Robert Balve, 9, rue St. Nicolas, Remich, Luxembourg

Filed Dec. 29, 1969, Ser. No. 888,794
Claims priority, application Luxembourg, Jan. 23, 1969, 57,835
Int. Cl. F01l *25/06*
U.S. Cl. 91—290 4 Claims



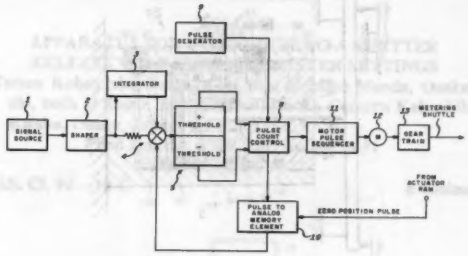
A control arrangement for pneumatic hammers comprises a reciprocating rocking piston for actuating an impact cutter and a rocking slide for controlling the input of the compressed air and the output of the consumed air. After a predetermined control angle of the rocking slide a tension means effects a complete reversal of the rocking slide and the rocking piston.

3,664,234

DIGITAL ELECTROHYDRAULIC SERVO ACTUATOR

Gerald F. Simons; Frederick W. Lynch, and Gary C. McKown, all of Phoenix, Ariz., assignors to Sperry Rand Corporation, Great Neck, N.Y.

Filed Apr. 27, 1970, Ser. No. 31,905
Int. Cl. F15b *9/03, 9/09, 9/10*
U.S. Cl. 91—363 6 Claims



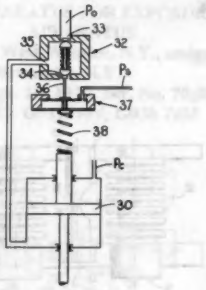
A hydraulic boost actuator having variable displacement and rate of displacement commands and controlled by a digital electronic system driving a stepper motor. The actuator may be operated either in a series or a parallel mode.

3,664,235

FLUID PRESSURE OPERATED SERVO ARRANGEMENT

Peter Walton, Gloucester, England, assignor to Serck Industries Limited, Birmingham, England

Filed May 13, 1970, Ser. No. 36,803
Claims priority, application Great Britain, Sept. 22, 1969, 46,487/69
Int. Cl. F15b *13/16*
U.S. Cl. 91—387 1 Claim

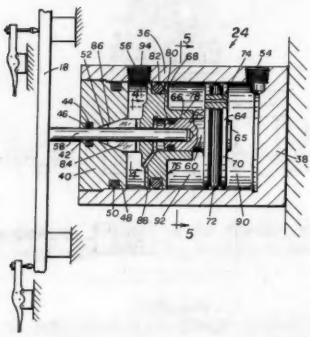


A servo arrangement includes a valve having a chamber into which opens a pair of aligned ports and a third port. A stem is movable within the pair of ports and carries a pair of closure members for the ports. The closure members are biased apart against stops so that in a mid-position of the stem both of the pair of ports are open to the third ports. When the stem has moved to shut one port, continued movement in the same direction allows a large flow through the other port. The servo arrangement also includes an actuating piston and a valve operating device responsive to a signal pressure and to the piston position. The valve controls the pressure supplied to one side of the piston.

3,664,236
RESISTANCE LOCKING CYLINDER

Richard C. Malott, 321 North Jackson, Spring Lake, Mich.

Filed Feb. 13, 1970, Ser. No. 11,213
Int. Cl. F15b *15/26*
U.S. Cl. 92—26 5 Claims

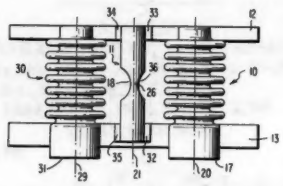


This disclosure relates to a table with a variable shape surface and locking cylinder therefor wherein the table is comprised of a plurality of vertically disposed resistance locking cylinders, each of which has a piston rod, the upper portion of which forms a portion of the variable shape surface. The piston rod is locked in place by a plurality of wedging members within the cylinder, the wedging members being forced against the piston rod when the piston rod encounters substantial resistance as it is extended.

3,664,237
PRESSURE SENSOR

Jerome M. Paros, Williamsville, N.Y., assignor to Sundstrand Data Control, Inc., Redmond, Wash.

Filed Jan. 21, 1970, Ser. No. 4,576
Int. Cl. F01b *19/00;* F16j *3/00*
U.S. Cl. 92—38 2 Claims

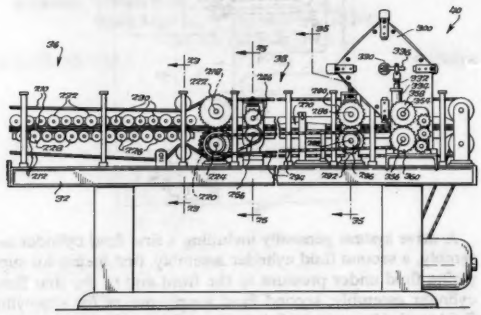


Disclosed is a pressure sensor containing: (1) a mechanical assembly, consisting of a bellows-pivot arrangement such as to yield a torque about a single sensitive axis wherein pressure is applied to the bellows, and (2) the appropriate electronics, consisting of a detection device to sense angular motion and a torquing device to restore the mechanical assembly to its null position. The amount of electrically generated torque necessary to balance the pressure induced torque is proportional to and a measure of the applied pressure.

3,664,238
APPARATUS FOR MAKING MULTI-PLY PAPER BAGS

Robert O. Baxter; Clint R. Hollis, and Carlton F. Evans, all of Camden, Ark., assignors to International Paper Company, New York, N.Y.

Original application Apr. 24, 1969, Ser. No. 818,909, now Patent No. 3,567,111. Divided and this application Oct. 2, 1970, Ser. No. 77,416
Int. Cl. B31b *1/00*
U.S. Cl. 93—8 R 7 Claims

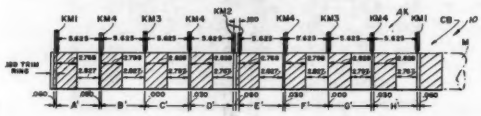


Apparatus for the manufacture of multi-ply paper bags having means for advancing bag blanks one after the other along a path, means along the path for heating the bottom end of the blank to soften the thermoplastic coating, means for applying a sealing force to the softened thermoplastic coating, means for holding the seal while the thermoplastic coating cools and hardens, means for embossing the bag blank along a fold line for folding the bag blank end along the fold line and for folding the folded portion into the side wall of the blank and means for applying, coating and adhesively securing a tape to the folded portion and the side wall of the blank.

3,664,239
LABEL REGISTRATION FOR HELICALLY WOUND CONTAINER BODIES

Wilhelm Woelbel, St. Louis, Mo., assignor to Container Corporation of America, Chicago, Ill.

Filed Jan. 20, 1971, Ser. No. 107,904
Int. Cl. B31c *1/00*
U.S. Cl. 93—80 6 Claims



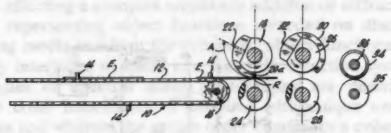
The error occurring in helically winding container bodies having a label pattern repeated thereon is minimized to an extent whereby the placement of the container closures at the ends thereof gives substantially similar appearance to all the containers irrespective from the point on the wound "-stick" where they originate.

3,664,240

ARRANGEMENT FOR ADJUSTABLE SPLIT SCORING OF SEAL AND BOTTOM SCORE OF AN ENVELOPE OF A BAG BLANK

Herbert W. Helm, Hollidaysburg, Pa., assignor to F. L. Smithe Machine Company, Inc., Duncansville, Pa.

Filed Sept. 17, 1970, Ser. No. 72,926
Int. Cl. B31b *1/14*; B26d *3/08*
U.S. Cl. 93—58.1 7 Claims



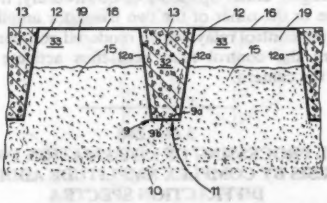
An apparatus whereby the seal score and bottom score is made on the seal and bottom flaps respectively of envelopes or bag blanks. The apparatus provides for split scoring and an adjustment for different size envelopes or bag blanks. Size changes are accomplished by a running adjustment of the one scorer, relative to the other scorer which remains fixed. The construction is such that the pull-out segment engages each envelope blank at a precise location so that the distance on the envelope blank for the first scoring operation thereon is always predetermined. Thus, a fine running adjustment is permitted along with quick size changes for envelopes or bag blanks. The scoring knives also may be mounted on a common cylinder.

3,664,241

METHODS FOR PRODUCING PAVEMENT-LIKE SITES

Jack Blackburn, 25 Springfield Hall Gardens, Huddersfield, England

Filed Mar. 25, 1970, Ser. No. 22,455
Int. Cl. E01c *7/10*
U.S. Cl. 94—10 11 Claims



Methods of producing a pavement-like site composed of separate areas at least including concrete areas by laying fluid concrete, and by the use of formers to separate said areas. The site may be composed of areas of concrete and areas of natural or imitation grass, sand or gravel or the like or areas of different colored concrete and the formers may remain in the site or be removed therefrom at some stage during its construction.

3,664,242

METHOD FOR MARKING ROADWAYS

Thomas L. Harrington, Saint Paul, and Jens L. Jorgensen, White Bear Lake, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of application Ser. No. 647,327, June 20, 1967, now abandoned, which is a continuation-in-part of application Ser. No. 314,505, Oct. 7, 1963, now abandoned.
This application June 15, 1970, Ser. No. 46,492
Int. Cl. E01c *21/00*
U.S. Cl. 94—22 7 Claims

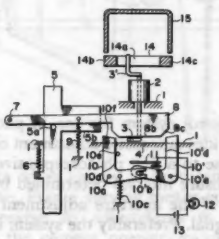
A method for forming traffic-control markings on roadways using a novel particulate marking material. The marking material is heated and projected to the roadway, and the resulting markings are ready to bear wheeled road traffic within seconds. The marking material comprises a particulate thermoplastic-resin-based composition having an organic phase that melts to a low-viscosity condition and principally comprises a polyamide resin. It also preferably includes an inert particulate material, preferably transparent glass beads, that is non-melting at the temperature of application of the marking material.

3,664,243

APPARATUS FOR INTERLOCKING A SHUTTER RELEASE WITH EXPOSURE METER SETTINGS

Tatsuo Kobayashi, Kaizuka-shi, and Keisuke Maeda, Osaka-shi, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Oct. 10, 1969, Ser. No. 865,451
Int. Cl. G03b *7/02*
U.S. Cl. 95—10 C 6 Claims



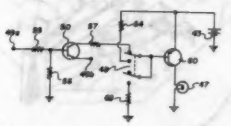
Apparatus to prevent actuation of a camera shutter release in accordance with underexposed and overexposed settings of an exposure meter. Movement of the shutter mechanism is prevented by its engagement with an arresting member rotated into operative position by movement of pointer locking apparatus having sloping edges at respective end portions thereof for receiving the pointer when it indicates underexposed and overexposed conditions.

3,664,244

INDICATING APPARATUS FOR EXPOSURE CONTROL APPARATUS

Richard C. Painton, West Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sept. 10, 1970, Ser. No. 70,981
Int. Cl. G01j *1/44*; G03b *7/08*
U.S. Cl. 95—10 CD 8 Claims

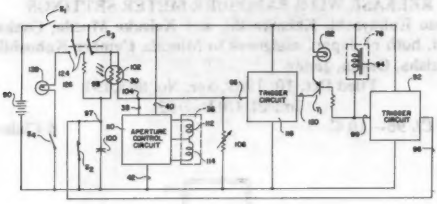


Indicating apparatus for use in a camera having a battery and automatic exposure control apparatus is disclosed. The indicating apparatus includes an amplifier and a manually operative switch member which in a first position couples the exposure control apparatus to the amplifier such that the amplifier will energize a low light indicating lamp only when the scene brightness is unsuitable for film exposure. The switch is movable to a second position to connect the first amplifier to a battery by way of a voltage divider network such that the first amplifier will energize the lamp only if a potential of the battery is above a predetermined level.

3,664,245
CAMERA APPARATUS FOR CONTROLLING DIAPHRAGM AND SHUTTER SPEED

Richard J. Bresson, and Richard C. Painton, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed June 22, 1970, Ser. No. 48,364
Int. Cl. G03b 7/08, 9/07
U.S. Cl. 95—10 CD 5 Claims

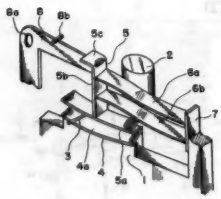


An exposure control system for use in photographic apparatus which provides automatic adjustment of the exposure aperture in response to a first photoresponsive signal before and during an exposure interval determined by a timing circuit as a function of the aperture adjustment and a second photoresponsive signal. Preferably the system includes an indicator controlled by both photoresponsive signals to provide an indication of low light conditions and of the termination of the exposure interval when such low light conditions prevail.

3,664,246
DEVICE FOR RESTRAINING A POINTER OF AMMETER FOR THE EXPOSURE METER IN A CAMERA

Yoshio Kuramoto, Sakai-shi, and Shotaro Inagaki, Okazaki-shi, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Minami-ku, Osaka, Japan

Filed Oct. 6, 1969, Ser. No. 864,102
Claims priority, application Japan, Oct. 15, 1968, 43/89968
Int. Cl. G03b 7/12
U.S. Cl. 95—10 C 5 Claims

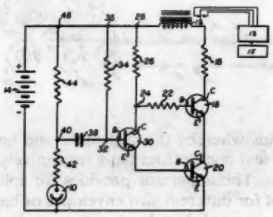


An exposure meter pointer clamping member having a planar surface is mounted to the movable ends of two spring members which extend from the camera body in parallel spaced relationship so that the planar surface is biased toward an opposing planar supporting surface whereby the pointer is restrained between the planar surfaces. A restraining member has a first position for opposing the force of the spring members to separate the planar surface and the planar supporting surface and a second position determined by the actuation of the shutter release mechanism to restrain the pointer.

3,664,247
SURVEILLANCE CAMERA WITH CIRCUIT FOR AUTOMATIC ACTIVATION

Edward M. Tellerman, East Rockaway, N.Y., assignor to Continental Instruments Corp., Oceanside, N.Y.

Continuation-in-part of application Ser. No. 717,577, Apr. 1, 1968, now Patent No. 3,536,923. This application July 6, 1970, Ser. No. 52,585
Int. Cl. G03b 19/02
U.S. Cl. 95—11 R 7 Claims

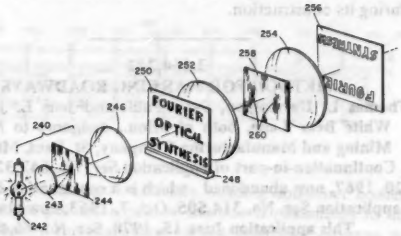


A camera which is automatically activated in response to the change in resistance of a photocell due to the occurrence of an event intended to be detected and recorded. The camera is provided with a network for translating such change in electrical resistance into the automatic activation of the camera drive motor. The camera drive motor is controlled by a relay which activates the motor only when the relay is energized. The relay is in series with a pair of transistor amplifiers, both on which must be conducting for the relay to remain in energized condition. The change in resistance of the photocell creates a change of potential across a condenser which, in turn, causes a temporary flow of current, which current affects the triggering current of a third transistor amplifier. This third transistor amplifier controls the other two transistor amplifiers in such a manner that whenever the triggering current of the third transistor amplifier is changed, either upwardly or downwardly, from a fixed value, one or the other of the two transistor amplifiers in series with the control relay will be rendered non-conducting to unenergize the control relay and thus activate the drive motor of the camera.

3,664,248
OPTICAL PROCESSING OF INFORMATION INCLUDING SYNTHESIS BY COMPLEX AMPLITUDE ADDITION OF DIFFRACTION SPECTRA

Peter F. Mueller, Concord, Mass., assignor to Technical Operations Incorporated, Burlington, Mass.

Continuation-in-part of application Ser. No. 564,340, July 11, 1966. This application May 3, 1968, Ser. No. 726,455
Int. Cl. G03b 33/00
U.S. Cl. 95—12.2 16 Claims



This disclosure depicts a number of ways for implementing a novel optical information processing technique utilizing a

phenomena (herein termed Fourier optical synthesis) involving effecting a complex amplitude addition of diffraction spectra characterizing two or more object functions. The processed object functions may represent totally different scenes, or color separation functions of a common colored scene. Embodiments are shown in which a plurality of object functions are recorded in an interlace geometry on a common recording medium to form a composite optical record suitable for processing using Fourier optical synthesis techniques as described in detail herein. The disclosure teaches effecting a complex amplitude addition of diffraction spectra representing object functions recorded on discrete recording media in which the processed object functions are optically interlaced in space in a coherent detection system. Techniques of spectral zonal photography are described wherein color information is encoded with unique carrier functions and wherein the zeroth order channel in a coherent optical detection system as well as a diffracted order channel or channels are utilized for the transmission of color information. Various other records and recording techniques and detection systems useful in the practice of the invention are also disclosed.

3,664,249

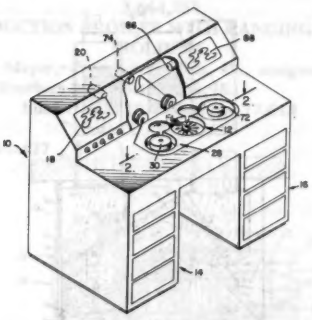
IMAGE EXPOSURE AND DEVELOPMENT METHOD AND APPARATUS

Alfred F. Kaspaul, Malibu, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Original application Jan. 9, 1969, Ser. No. 789,997, now Patent No. 3,585,965, dated June 22, 1971. Divided and this application Feb. 17, 1971, Ser. No. 115,943

Int. Cl. G03b *17/50*

U.S. Cl. 95—13 **9 Claims**



The image exposure and development apparatus provides for exposure of a sensitive medium which is developable by the deposition of atoms thereon, such as a sensitized nucleation material and development thereof by the deposition of metal from metal vapor. Following exposure, the exposed medium is continuously fed to and wrapped around a major portion of the circumference of spaced discs. Atoms from a vapor source between the discs impinge upon the medium and the latent image thereon is developed by selective acquisition of the metal onto the surface. The surface characteristics of the medium and discs are such that little metal is deposited upon the discs.

3,664,250

COMPACT VARIABLE FRAME VIEWFINDER

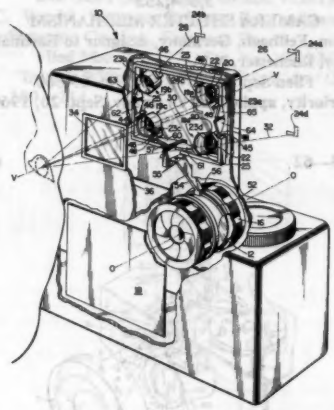
Edwin H. Land, Cambridge, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed June 11, 1970, Ser. No. 45,418

Int. Cl. G03b *13/20;* G01c

U.S. Cl. 95—44 C **14 Claims**

A photographic camera is disclosed as having a variable frame viewfinder comprising a plurality of discrete reticles respectively defining framing marks and a corresponding plurality of reticle imaging means, one associated with each of the reticles, for projecting virtual images of the framing marks into the viewed field. The reticles and associated imaging means are positioned on the periphery of the field of view of the observer such that the virtual images of the framing



marks cooperate when viewed in composite to frame a portion of the scene. Frame varying means coupled to the reticles and responsive to adjustments in a focus control mechanism on the camera operate to vary in accordance with a predetermined program the framed portion of the scene so as to compensate for sighting parallax and field size changes.

3,664,251

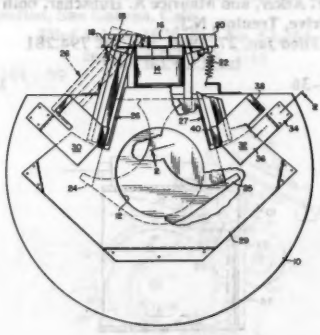
ELECTROMAGNETIC SHUTTER WITH DETENT

Andrew W. Vincent, 65 Aberdeen Street, Rochester, N.Y.

Original application Apr. 16, 1969, Ser. No. 816,535, now Patent No. 3,595,553. Divided and this application Apr. 1, 1971, Ser. No. 130,168

Int. Cl. G03b *9/14*

U.S. Cl. 95—59 **3 Claims**



An electromagnetically actuated photographic shutter including an actuator having a relatively uniform output force characteristic, and a shock absorbing stop consisting of a member having an inclined abutment surface in the path of travel of the body to be stopped. The abutment surface is inclined relative to the direction of travel of the body, and is resiliently movable in a direction generally normal to the direction of travel and fixed against motion in the direction of travel. The abutment surface is preferably covered with a

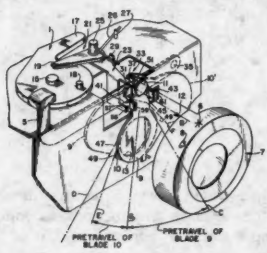
pad of a compressible material having a relatively high coefficient of friction. When the moving body strikes the abutment surface it drives the stop laterally, and energy is dissipated by compression of the compressible material and friction. In the shutter, the blades are mounted on beams that are shaped to engage the stop.

3,664,252

CAMERA SHUTTER MECHANISM

Horst Simon, Fellbach, Germany, assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sept. 4, 1970, Ser. No. 69,860
Claims priority, application Germany, Sept. 20, 1969, P 19 47 708.8
Int. Cl. G03b 9/14
U.S. Cl. 95—62 **6 Claims**



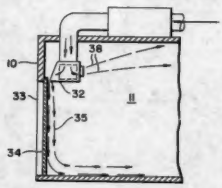
A multi-speed camera shutter mechanism comprises a pair of pivotally mounted blades, each of which is adapted to cover the exposure aperture of the camera. A short exposure period is effected by simultaneously driving the blades in opposite directions, and a longer exposure period is effected by releasably locking one blade in a position wherein it does not cover the aperture and by driving only the other blade to make an exposure.

3,664,253

CONDITIONED AIR DISTRIBUTION SYSTEM

Gunnar C. F. Asker, and Maurice A. Hubscher, both of 18 Industrial Drive, Trenton, N.J.

Filed Jan. 27, 1969, Ser. No. 794,281
Int. Cl. F24f 9/00
U.S. Cl. 98—36 **13 Claims**



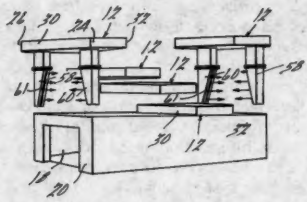
Air distribution system wherein polluted air is withdrawn and fresh replenishing air is brought into the system, desirably with heat exchange and temperature adjustment to that of a conditioned space, and is distributed alternately as an air screen over any open doorway or conveyor opening and when the doorway or conveyor opening is closed, the fresh air flow is shifted by damper means to a central distribution point.

3,664,254

MODULAR ROOF SYSTEM

Artel R. Henson, Birmingham, Mich., assignor to Disco Engineering, Inc., Detroit, Mich.

Filed Nov. 26, 1969, Ser. No. 880,330
Int. Cl. F24f 9/00
U.S. Cl. 98—36 **21 Claims**



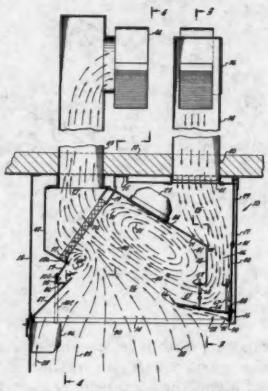
A modular system for providing a roof structure for new and old buildings and designed for the containment of air curtain door systems, heating, cooling, ventilating and make-up air equipment and the like, and adapted for universality of application in various styles of building architecture.

3,664,255

APPARATUS AND METHOD FOR REMOVING FUMES FROM THE SPACE ABOVE A COOKING APPLIANCE

Irvin R. Kuechler, San Bernardino, Calif., assignor to Gausewitz, Carr & Rothenberg, a part interest

Filed July 6, 1970, Ser. No. 52,469
Int. Cl. F23j 11/00
U.S. Cl. 98—115 K **46 Claims**



A self-contained, mass-producible fume hood or canopy for mounting in the space above a cooking appliance, so that fumes which pass upwardly into the hood will be removed from the room. Supply air from the exterior of the room is supplied to the hood and is fed through a baffle and throat apparatus toward filter and exhaust means, such baffle and throat apparatus being horizontally, vertically and angularly adjustable. The direction of supply air flow from the baffle and throat apparatus is caused to be substantially perpendicular to the filter, and the supply air first strikes the filter at an intermediate region as distinguished from the upper and lower regions. The relationships are caused to be such that some of the supply air passes directly through the filter, whereas other supply air rolls or vortexes (swirls) upwardly and downwardly. Upper and lower deflector means are provided to cause the upwardly and downwardly rolling supply air to return to the filter means for exhaust therethrough. The upper vortex is caused to be very large, whereas the lower is small. Means are provided to direct part of the

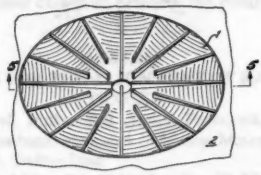
supply air horizontally below the adjustable baffle and throat apparatus, thus entraining fumes and directing the same toward the filter means. Inclined means are provided to deflect fumes into the region above the lower deflector means. Trough and heater means are provided to receive grease from the filter, and means are provided to remove condensed water. The method of the invention relates to the critical air velocities, directions, and paths adapted to effect a substantially 100 percent removal of fumes from the region above the cooking appliance, with very little removal of cooled or heated air from the room.

3,664,256

COOKING GRILL

Inez H. Peirce, 157 Camino San Clemente, San Clemente, Calif.

Filed Aug. 14, 1969, Ser. No. 850,083
Int. Cl. A47j *37/06*
U.S. Cl. 99—425 **5 Claims**



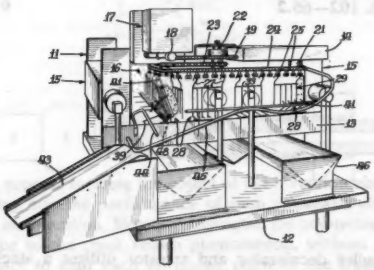
This invention comprises a grill cast in a form which will facilitate the ready drainage by gravity of the fatty components out of the meat being cooked thereon.

3,664,257

PRODUCTION BROILER WITH HANGING FOOD HOLDERS

Alfred E. Meyer, Prospect Heights, Ill., assignor to Anetsberger Brothers Inc., Northbrook, Ill.

Filed Oct. 2, 1970, Ser. No. 77,614
Int. Cl. A47j *37/04*
U.S. Cl. 99—427 **11 Claims**



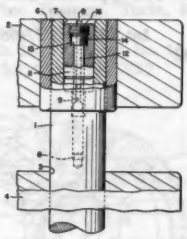
Production broiler with vertically disposed burner means defining a plurality of open-ended broiler spaces, an endless chain supported and driven by sprockets mounted on vertical axes, hangers spaced along and supported by the chain for movement longitudinally of the broiler spaces, food holders removably depending from the hangers by means of hanger-engaging portions spaced longitudinally from each other, each food holder comprising a first part engaging the hangers and a second part having a base pivotally mounted at its outer edge on the first part and a wall upstanding therefrom to define a tray for normally supporting a meat patty on edge, the weight of the patty maintaining the tray in closed position, a delivery chute, means for automatically moving the trays to open position to deliver patties therefrom into the chute, means operable automatically thereafter to move the trays to closed position, and normally inoperative deflector means selectively movable to operative position to effect automatic disengagement of the food holders from the hangers for cleaning purposes.

3,664,258

DIE SUPPORT WITH GUIDE POSTS

John C. Vecchi, Natrona Heights, Pa., assignor to Oberg Manufacturing Co., Inc., Freeport, Pa.

Filed Mar. 10, 1971, Ser. No. 122,920
Int. Cl. B30b *1/00*; B26d *5/08*; F16c *1/26*
U.S. Cl. 100—214 **5 Claims**



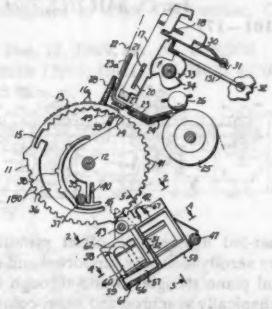
A die support is provided with a plurality of parallel passages through it, in each of which an end portion of a projecting guide post fits tightly. The end portion of the post is split lengthwise and provided with an inwardly tapered axial socket and with a threaded axis bore extending inwardly from the inner end of the socket. Fitting in the socket is a hollow tapered wedge, in which is rotatably mounted a screw that extends into the threaded bore. Means are provided for holding the screw against axial movement in the wedge so that tightening of the screw will draw the wedge inwardly of the socket to expand the post into tight engagement with the surrounding wall of the passage and loosening of the screw will force the wedge outwardly in the socket to permit the post to contract so it can be withdrawn from the passage.

3,664,259

DRUM SERIES PRINTER WITH STOP PAWL ENGAGED BY A SNAP-OVER SPRING

David Weinkle, Sierra Madre, Calif., assignor to Addmaster Corporation, San Gabriel, Calif.

Filed July 6, 1970, Ser. No. 52,264
Int. Cl. B41j *7/34*, *7/48*
U.S. Cl. 101—99 **13 Claims**



A printer is disclosed having type members carrying type characters, the members being yieldably advanced past a printing point and arrested by electromagnetically actuated pawls which are yieldably maintained in both retracted posi-

tions and arresting positions by snap-over springs. Abutments on the type members engage the pawls when the type members are in home positions to prevent accidental movement of the pawls to arresting positions. The electromagnetically operable means comprises pairs of side-by-side magnet modules in which each module is effective to retain the parts of an adjacent module in place.

3,664,260

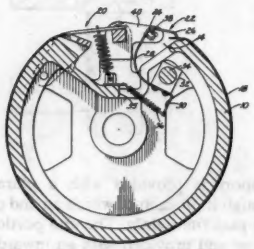
MASTER SHEET RETAINER FOR PRINTING MACHINES

Donald J. Miller, Lakewood, and Raymond J. Schmidlin, Lyndhurst, both of Ohio, assignors to Addressograph Multigraph Corporation, Cleveland, Ohio

Continuation of application Ser. No. 769,988, Oct. 23, 1968, now abandoned. This application June 15, 1970, Ser. No. 48,897

Int. Cl. B41f *27/06*

U.S. Cl. 101—132 **13 Claims**



A device for retaining the trailing end of a master sheet on a printing machine drum includes a retainer member movable between an open position for receiving the trailing end and a closed position for holding the trailing end of the master sheet. An actuating means, provided on an impression cylinder in printing relationship with the printing machine drum, acts against the trailing end of the master sheet which acts against the retainer member in such a way as to move the retainer member to the open position and the trailing end of the master sheet under the retainer member. Spring means is provided for restoring the retainer member to the closed position and for maintaining it closed and in holding engagement with the trailing end of the master sheet during a printing operation.

3,664,261

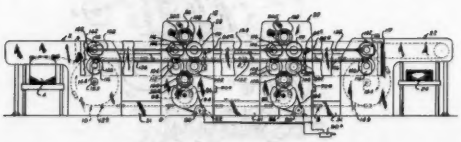
STRAIGHT FEED PRESS

Harold P. Dahlgren, 726 Regal Row, Dallas, Tex.

Filed June 17, 1968, Ser. No. 737,521

Int. Cl. B41f *7/12, 7/04*

U.S. Cl. 101—177 **45 Claims**



A sheet-fed lithographic offset printing press in which sheets are aerodynamically supported and directed in a single horizontal plane straight to and through individually driven and mechanically synchronized multi-color perfecting towers while the sheet is continuously gripped and moved by a single set of grippers at the leading edge so that only blanket printing cylinders touch the sheet, eliminating sheet transfer between the time the sheet leaves the feeder and the time it reaches the delivery.

3,664,262

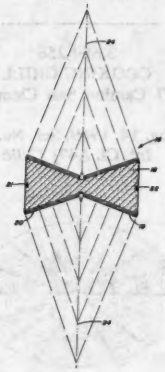
REACTIVE FOCUSING WARHEAD CONCEPT

Millard F. Rose, Dahlgren, and James C. Talley, Fredericksburg, both of Va., assignors to The United States of America as represented by the Secretary of the Navy

Filed May 23, 1969, Ser. No. 828,449

Int. Cl. F42b *1/02*

U.S. Cl. 102—56 **9 Claims**



A warhead containing two components, each of which is explosively inert alone but which explode when combined. Upon detonation of the warhead the components are propelled along separate paths to a point near the target where they combine and explode to extend the destructive radius of the warhead.

3,664,263

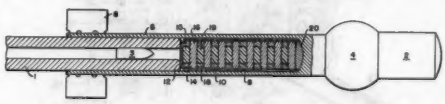
BULLET TRAP

John J. Driscoll, Paris, France, assignor to Allied Research Associates, Inc., Concord, Mass.

Filed Aug. 7, 1969, Ser. No. 848,174

Int. Cl. F41j *1/12*

U.S. Cl. 102—65.2 **9 Claims**



A bullet decelerator and arrestor utilizes a stacked assembly of bullet arresting discs alternating with resilient discs. The disc assembly is enclosed by pliable material and contained within a grenade assembly or other body to be accelerated by the bullet.

3,664,264

BI-DIRECTIONAL FUZE ASSEMBLY

David E. Benner, Webster, Ind., assignor to Avco Corporation, Richmond, Ind.

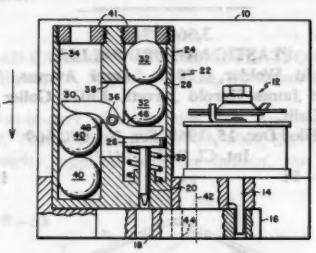
Filed Nov. 6, 1969, Ser. No. 874,584

Int. Cl. F42c *1/04*

U.S. Cl. 102—73 **3 Claims**

The disclosure shows a fuze assembly capable of detonating a bomb whether mounted in a nose well or a tail well therein. A pair of inertia balls are mounted in side-by-side

cylindrical raceways. Dependent upon the fuze assembly being mounted in a tail well or nose well, one or the other of



the pairs of balls acts on a pivotal lever to drive a firing pin against a detonator charge to detonate the bomb.

3,664,265

PROCESS FOR THE ALIGNMENT OF RAILWAY TRACKS

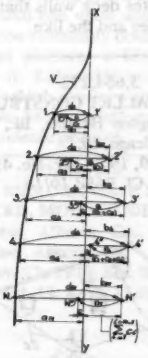
Gerard Sauterel, Pully, and Andre Fornerod, Grandvaux, both of Switzerland, assignors to Matisa Materiel Industriel S.A., Crissier, Switzerland

Filed Mar. 20, 1970, Ser. No. 29,333

Claims priority, application Switzerland, Mar. 24, 1969, 4372/69

Int. Cl. E01b *33/02, 35/10*

U.S. Cl. 104—8 **4 Claims**



The process forming the object of the invention aims at integrating into the performance of each automatic alignment cycle, an operation, likewise automatic, for compensating errors due to the track return phenomenon, without it being necessary to shift each corrected point of the track twice; this feature permits without difficulty, the use of the process for tamping-levelling-aligning machines, as well as for independent alignment machines.

3,664,266

PEDESTRIAN TRANSPORT CONVEYOR INSTALLATIONS

Stephen W. Tonkin, Bristol, England, assignor to Dunlop Holdings Limited, London, England

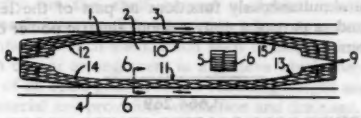
Filed Feb. 10, 1970, Ser. No. 10,184

Claims priority, application Great Britain, Feb. 21, 1969, 9,611/69

Int. Cl. B65g *17/06*

U.S. Cl. 104—25 **8 Claims**

A variable speed passenger conveyor comprising a multiplicity of rhomboid shaped platforms mounted in slidable



relation to each other along their contiguous sides.

3,664,267

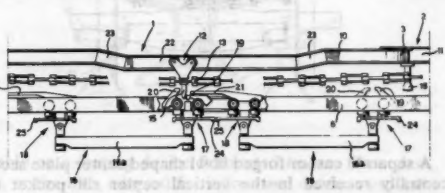
OVERHEAD DUAL-TRACK CONVEYORS SYSTEMS

Gaetano Di Rosa, Pino Torinese, Turin, Italy, assignor to SOC. F.A.T.A. S.p.A., Turin, Italy

Filed Feb. 16, 1970, Ser. No. 11,800

Int. Cl. B65g *17/42*

U.S. Cl. 104—96 **5 Claims**



A conveyor system has a first and a second upper track diverging from a continuous lower track. Downwardly projecting pushers supported by the upper tracks couple with carriers on the lower track and drive them forward. The carriers have coupling and uncoupling means such that a following carrier striking a preceding carrier is uncoupled from its pusher because a finger on the preceding carrier swings a detent rocker out of the path of the pusher.

For transfer a zone of the first upper track near the point of divergence from the lower track is lowered. A pusher traversing this zone remains coupled to a carrier even though the rocker of that carrier has been swung to its normally inoperative position. The preceding carrier, arrested on the track because its pusher has moved transversely away the rocker with the curvature of the upper track, is pushed forward by the following carrier. The preceding carrier is then coupled by a pusher of the second upper track and driven along the second conveyor.

3,664,268

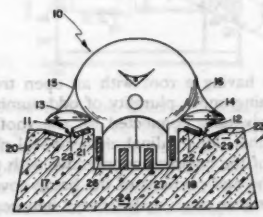
SYSTEM FOR AND METHOD OF LEVITATING VEHICLES IN A GROUND TRANSPORTATION SYSTEM

Edward J. Lucas, Wayland, Mass., and Jean C. Lafrance, Vienna, Va., assignors to Avco Corporation, Cincinnati, Ohio

Filed Dec. 15, 1969, Ser. No. 884,906

Int. Cl. B61b *13/08*; H01f *7/00*; H02k *41/00*

U.S. Cl. 104—148 SS **2 Claims**



Apparatus for and a method of levitating vehicles in a ground transportation system wherein the magnetic field of a

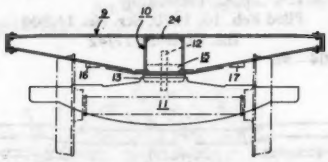
direct current power transmission line in conjunction with superconductive magnets in the vehicle cooperate to provide levitation of the vehicle. The direct current power transmission line simultaneously functions as part of the levitation system and as part of a conventional electric power distribution system.

3,664,269

COMBINED BODY BOLSTER CENTER FILLER AND CENTER PLATE FOR RAILWAY CARS

Stanley H. Fillion, Wilmette, Ill., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed May 27, 1970, Ser. No. 40,978
Int. Cl. B61c *9/48*
U.S. Cl. 105—199 C **11 Claims**



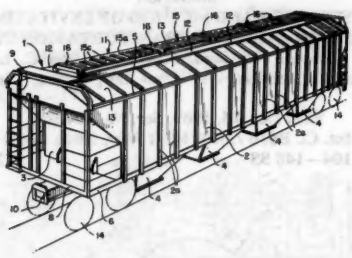
A separate cast or forged bowl shaped center plate secured centrally received in the vertical center sill pocket of a freight car body where intersecting the body bolster. Located rigidly, secured, longitudinally displaced within the sill at each opposite end of the center plate is a vertical spacer plate for withstanding the shear and vertical forces service imposed thereat. A separate tie plate horizontally spanning the sill pocket exterior of the center plate and connected to the underedge of each spacer plate provides stiffening reinforcement. By welding the bowl substantially all around to the underedges of the spacer plates and sill wall extents therebetween, maximum in-service load support is provided.

3,664,270

COVERED HOPPER CAR WITH HATCH COVER MEANS

Marvin Stark, Michigan City, Ind., and Willis H. Knippel, Palos Park, Ill., assignors to Pullman Incorporated, Chicago, Ill.

Filed Jan. 2, 1970, Ser. No. 90
Int. Cl. B61d *39/00*
U.S. Cl. 105—377 **16 Claims**



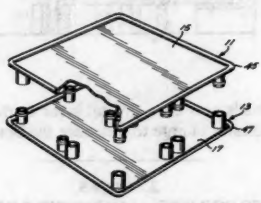
A hopper car having a roof with an open trough hatch defined by coaming and a plurality of odd numbered hatch cover sections pivotally connected on the roof and overlapping one another, longitudinal and end seal means being along the sides of the coaming cooperative with the longitudinal side and the end portions of the hatch cover sections; and further transverse seam seals located between the cover sections by seal retainers on adjacent cover sections, and hold-down means at the seams of the hatch cover sections and ends of the hatch cover sections and intermediate of the hatch cover sections, the hold-down means being locked by spring lock means on the car roof, the adjacent tapered edges of the longitudinal seals on each of the sections compressingly sealing with one another.

3,664,271

PLASTIC MOLDED PALLET

Ernest Harold Wolder, 12011 Laurel Avenue, Whittier, Calif., and James Harold Jarrett, 13012 Goller Avenue, Norwalk, Calif.

Filed Dec. 15, 1969, Ser. No. 870,669
Int. Cl. B65d *19/18*
U.S. Cl. 108—51 **12 Claims**



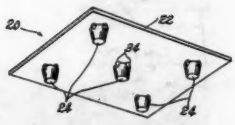
Formed pallet apparatus including first deck means formed with a first deck wall and a plurality of integral female sockets. Second deck means is formed with a second deck wall and a plurality of integral male plugs which are formed to be telescopically received in the respective sockets to support the deck walls in spaced apart relationship. Coupling means is provided for coupling the plugs in the sockets whereby the first and second deck means may be formed separately and then coupled together to form a pallet apparatus which incorporates deck walls that are spaced apart for receipt of lift-fork tines and the like.

3,664,272

STACKABLE PALLET CONSTRUCTIONS

James S. Sanders, Arlington Heights, Ill., assignor to Skid-Stack Corporation, Chicago, Ill.

Filed June 10, 1970, Ser. No. 45,011
Int. Cl. B65d *19/18*
U.S. Cl. 108—53 **21 Claims**



The illustrated pallet comprises a plurality of legs having hollow cup-shaped bodies extending through openings in the pallet member, which may be made of corrugated cardboard or other suitable material. Each leg is made in one piece, preferably of plastic material. A flange projects outwardly from the upper end of the body and engages the upper surface of the pallet member. Each leg is retained in the corresponding opening by one or more lugs projecting outwardly from the body, for engagement with the underside of the pallet member. In one embodiment, each lug comprises an upwardly facing shoulder and a downwardly tapering side surface for temporarily displacing the material of the pallet member by a wedging action, when the body of the leg is forced through the corresponding opening. The displaced material of the pallet member snaps into its final position above each lug when the leg has been fully inserted. The cup-shaped bodies of the legs taper downwardly so as to be stackable. In another embodiment, the lugs are adapted to be inserted through cut-outs or notches formed in the edges of the openings. Each leg is then rotated to move the lugs under

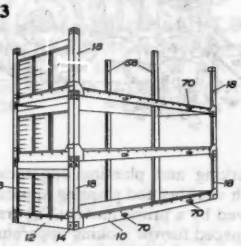
the pallet member. Each lug preferably has a shoulder which is inclined to produce a wedging action with the underside of the pallet member. One or more locking teeth are preferably provided on each shoulder, to dig into the material of the pallet member.

3,664,273

LOAD CARRYING STACKING PLATFORMS

Theodore Howe, 17, Heyhouses Lane, St. Annes-on-Sea, England

Continuation-in-part of application Ser. No. 870,156, June 27, 1969. This application Nov. 14, 1969, Ser. No. 876,798
Claims priority, application Great Britain, Nov. 21, 1968, 55,189/68
Int. Cl. B65d *19/18*
U.S. Cl. 108—53 4 Claims



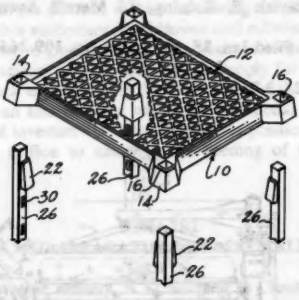
The invention relates to stacking platforms for transporting goods, wherein there is a basal part and corner posts which are pivotally mounted on the basal part whereby a plurality of such loaded platforms can be stacked one upon another when said posts are locked in an upright position and a plurality of such platforms, when unloaded, can be stacked one upon another in a minimum of height with said pots in a collapsed condition, means being provided whereby a number of such platforms, stacked one upon another with their corner posts collapsed, can be releasably connected together so that when the uppermost platform is lifted the remainder are suspended beneath it. Releasable connecting means comprises a member 56 which can turn so that a head 58 which passes through a hole 54 in a platform above it can occupy either a locked or a release position.

3,664,274

ADJUSTABLE MERCHANDISE SUPPORT WITH SPACED, MOLDED SHELVES

Rafael Thomas Bustos, Atlanta, Ga., assignor to Southern Cross Industries, Inc., Atlanta, Ga.

Filed Nov. 12, 1970, Ser. No. 88,560
Int. Cl. A47b *13/02*
U.S. Cl. 108—144 10 Claims



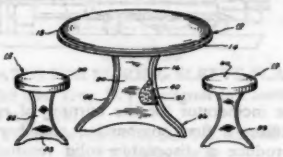
A merchandise shelf arrangement utilizing molded plastic shelves each of which has a corner arrangement with an open bore through which is fitted a respective vertical support member resting on the floor. Tapered plastic inserts removably placed between the vertical members and the respective bore of each shelf corner retains the shelf in a selected location ready for easy removal and re-positioning. Projecting lugs or tongues on each molded insert are fitted respectively into one of many vertically spaced locations on a vertical member to hold the tapered insert in place. Weight from a number of cartons of bottles or the like pressing downwardly on the shelf causes a tighter relationship between each insert and its respective corner to assure positive retention of each shelf. Each shelf is molded integrally with each corner arrangement in a pattern which may be in the form of an open grid structure reducing weight and is of plastic material and providing ventilation and drainage.

3,664,275

TABLE OR SEATING DEVICE

Werner L. Kleinert, 37246 Ruth Drive, Sterling Heights, Mich.

Filed May 15, 1970, Ser. No. 37,524
Int. Cl. A47b *13/02*
U.S. Cl. 108—150 11 Claims



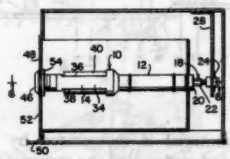
A table or a seating device fabricated from a fiber glass, plastic, or the like, adapted for indoor and outdoor use having a top planar member maintained in a horizontal position by a support base comprised of at least three identical legs, disposed in a side by side relationship. The outer surface of each leg being dished inwardly to form a generally concave surface extending from the bottom to the top end thereof; a portion of the top end being flared outwardly with respect to the concave surface such that the upper surface of each flared out portion is positioned to be fastened to the lower surface of a top planar member. Upon assembly of the top planar member with each flared out portion, the adjacent edges of each leg abut to define a line at least portion of which is concave. The interior portion of the support base defined by the inner walls of each leg is adapted to be filled with a material of sufficient consistency to provide ballast for maintaining the table or seating device in an upright position when the same is subjected to an external force, such as wind and the like.

3,664,276

COMBINATION LOCK AND DETERRENT

Nunzio J. Palumbo, 3515 Post Road, Huntingdon Valley, Pa., and Jack F. Macione, P.O. Box 381, Hatboro, Pa.

Filed Apr. 27, 1970, Ser. No. 32,291
Int. Cl. G08b *15/02*; E05g *3/00*
U.S. Cl. 109—29 12 Claims



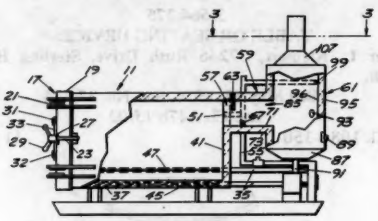
A combination lock and deterrent device comprising a rotatable, elongated body having a deterrent gas cartridge removably affixed thereto, the said body retaining a spring biased firing pin therein in spaced relationship from one end of the said deterrent gas cylinder, and a firing pin release mechanism, portions of which are affixed to the enclosure guarded by the device and which are responsive to actions initiated to force open the enclosure to thereby release the firing pin.

3,664,277

ON-SITE INCINERATOR

Anil K. Chatterjee, Tonawanda, and James R. O'Grady, Lockport, both of N.Y., assignors to The Carborundum Company, Niagara Falls, N.Y.

Filed July 31, 1970, Ser. No. 60,018
Int. Cl. F23g 5/12
U.S. Cl. 110—8 A 6 Claims



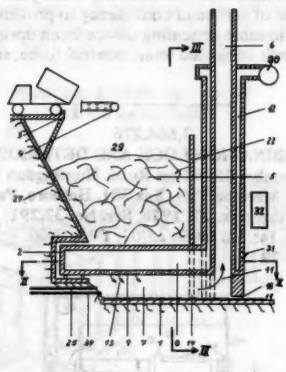
An on-site incinerator for the burning of refuse without pollution utilizes a first combustion chamber for burning refuse to produce a disposable solid residue and an incompletely combusted gaseous effluent. Gaseous effluent from the first combustion chamber is intimately mixed with air in a mixing zone before its entry into a secondary combustion chamber wherein the combustion of gaseous effluent is completed, and the resulting inert effluent is discharged.

3,664,278

METHOD AND APPARATUS FOR INCINERATING SOLID MATERIALS

Gerhard Steen, Lappenbergsallee 8c, 2 Hamburg 19, Germany

Filed Sept. 8, 1970, Ser. No. 70,086
Int. Cl. F23g 5/00
U.S. Cl. 110—8 R 21 Claims



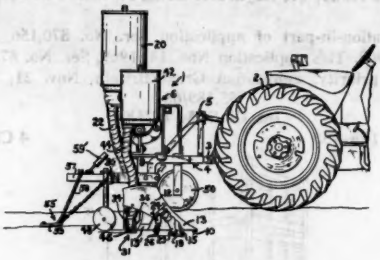
Combustible material is incinerated by piling about a horizontal overhead girder until the material closes the space between the ground and the girder on both sides of the girder, leaving an empty space below the girder that serves as a combustion chamber whose two side walls are the material to be incinerated. Oxygen-containing gas is preheated and fed to the combustion chamber lengthwise of the girder and out through downwardly and laterally outwardly inclined openings through the underside of the girder. The combustion chamber is maintained at subatmospheric pressure by discharging the flue gas through a chimney.

3,664,279

EARTH WORKING AND PLANTING APPARATUS AND METHOD OF PLANTING SEED

Rex Belden, 202 North Grant, Smith Center, Kans.

Filed Mar. 4, 1970, Ser. No. 16,475
Int. Cl. A01c 5/00
U.S. Cl. 111—80 5 Claims



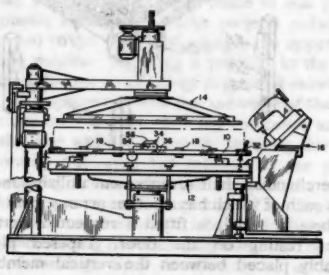
An earth working and planting apparatus and method wherein an earth working and planting apparatus is mounted on a frame moved by a prime mover. The frame has one or more laterally spaced furrow making apparatus and each has double moldboard lister with a double share bottom positioned at the forward end of the frame for opening a main furrow and forming ridges on each side thereof. A shovel or subsoiler is positioned rearwardly of the lister for opening a narrow fertilizer trench within the main furrow to receive fertilizer from a fertilizer distributor having an open end aligned with the fertilizer trench. A plurality of spaced tines are positioned rearwardly of the shovel to mix soil and fertilizer, fill the fertilizer trench, and increase the tilth of the fertilizer trench. A seed furrow is opened adjacent each opposite edge of the main furrow by a pair of shovels having forwardly curved and pointed lower ends. The seed furrows receive seed from a dispensing shoe directing seed in a wide random pattern into the respective seed furrow and the main furrow is widened by a concave disc engaging each side of the main furrow. A drag is mounted on a rear end of the frame and is positioned to pack the soil moved into the widened furrow to firmly cover the seed in each of the seed furrows within the main furrow.

3,664,280

MATTRESS CLOSING MACHINE WITH AUTOMATIC POSITIONING MEANS FOR A MATTRESS ASSEMBLY

Howard E. Redman, 178 Summer Street, Weymouth, Mass., and Frederick E. Kaining, 15 Merrill Avenue, Quincy, Mass.

Filed Jan. 25, 1971, Ser. No. 109,265
Int. Cl. D05b 11/00
U.S. Cl. 112—3 R 14 Claims



A mattress closing machine comprising a horizontal table adapted to receive a mattress assembly for sewing along one

edge at one broad side and then along the edge at the other broad side, motor-driven conveyor belts mounted on the table operable to draw a mattress assembly onto the table and discharge it therefrom, and a control circuit including a starting switch operable to initiate operation of the conveyor belts to draw a mattress assembly onto the table and automatically position it relative to a sewing instrumentality for sewing and after sewing to effect discharge from the table.

3,664,281

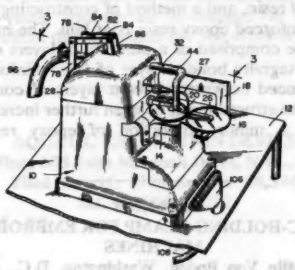
MATERIAL FEEDING GUIDE SYSTEM FOR INDUSTRIAL SEWING MACHINERY

Arthur Shulman, New York, and Henry M. Bonis, Jr., Sands Point, both of N.Y., assignors to Nabs Leasing Corp., New York, N.Y.

Continuation-in-part of application Ser. No. 842,187, July 16, 1969, now Patent No. 3,570,425, dated Mar. 16, 1971. This application Mar. 1, 1971, Ser. No. 119,573

Int. Cl. D05b *23/00, 35/00, 35/10*

U.S. Cl. 112—20 **14 Claims**



Two open fluid systems are utilized as feeding guides for a sewing machine. In the first system a compressed air conduit is pivotally mounted within the cover of the sewing machine and assumes an operative position wherein an outlet orifice is positioned in front of a pair of horizontal feeding discs. A stream of air is forced through the outlet orifice toward a seam line of strips of material having a plurality of furlike strands which are being steamed together as they are fed between the discs. The second open fluid system includes a vacuum nozzle positioned beneath and spaced from the discs and any loose strands are collected by the nozzle. To rotate the conduit from operative to idle positions, a take off linkage is driven by an existing foot pedal control of the sewing machine and transmits axial movement to a sleeve cam mounted on the conduit within the sewing machine. The cam co-acts with a stationary pin follower and rotates the conduit. In its operative position, the cam abuts a switch which activates a vacuum and compressed air supply for the systems. An idle track is provided in the cam whereby the conduit will remain in an idle position while the foot pedal is moved. A mechanical inverted "U" shaped guide is positioned adjacent the outlet orifice to assist in the feeding of the strips of material.

3,664,282

METHOD AND APPARATUS FOR ASSEMBLING SHIRT PARTS

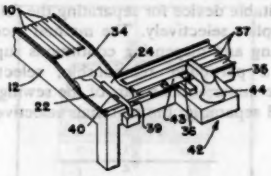
Albert E. Wagar, Albany, N.Y., assignor to Cluett, Peabody & Co., Inc., Troy, N.Y.

Filed Oct. 28, 1970, Ser. No. 84,590

Int. Cl. D05b *21/00*

U.S. Cl. 112—121.15 **5 Claims**

Method of assembling shirt parts including the steps of aligning two yoke pieces with the upper edge of a shirt back, stitching the yoke to the shirt back, simultaneously stitching the shirt fronts to the shirt back to form side seams, drawing a free end of one shirt front away from the assembled parts and hemming the bottom edges of the shirt fronts and back. The apparatus includes two conveyors mounted at right angles to each other. The first conveyor has an inclined surface



at one end thereof which extends across the width of the second conveyor. A smooth turning rod extends across the width of the second conveyor and generally in the direction of the first conveyor.

3,664,283

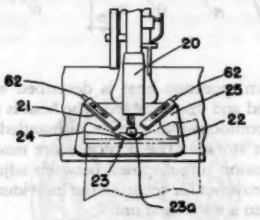
APPARATUS FOR MAKING SLEEVE PLACKETS

Richard J. McFalls, Troy, N.Y., assignor to Cluett, Peabody & Co., Inc., Troy, N.Y.

Filed Apr. 6, 1970, Ser. No. 25,968

Int. Cl. D05b *21/00*

U.S. Cl. 112—121.15 **5 Claims**



Apparatus for making a shirt sleeve placket, including two angled folder plates and a hold-down element for retaining the folded construction in shape for sewing on a profile sewing machine.

3,664,284

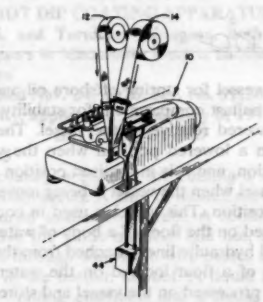
MATERIAL HANDLING APPARATUS, METHOD AND ARTICLE FORMED THEREFROM

James F. Hester, 4109 Northampton Drive, Winston-Salem, N.C.

Filed Mar. 9, 1970, Ser. No. 17,540

Int. Cl. D05b *35/06*

U.S. Cl. 112—152 **1 Claim**



Material handling apparatus, method and article formed by the method directed to simultaneously dispensing, folding

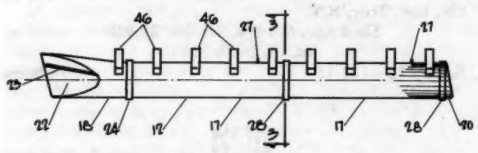
and joining at least two supplies of continuous web material in a predetermined relationship which can be selectively established or vitiated. The apparatus incorporates a folding and guide means for dispensing folded material into a predetermined relationship, additional components to selectively move the folded materials out of and into that relationship and a suitable device for separating the folded materials from the supplies selectively. The method incorporates the steps of folding and dispensing continuous supplies of web material in a particular relationship, selectively sewing together these materials as a part of the sewing operation or otherwise and separating the materials selectively from their supplies.

3,664,285

KNOCKDOWN PONTOONS FOR PORTABLE BOATS AND THE COMBINATION THEREOF

Gerald T. Rabideau, Toledo, Ohio, assignor to Mio Marine Corporation, Toledo, Ohio

Filed June 4, 1968, Ser. No. 734,345
Int. Cl. B63b *35/38*
U.S. Cl. 114—0.5 F **6 Claims**



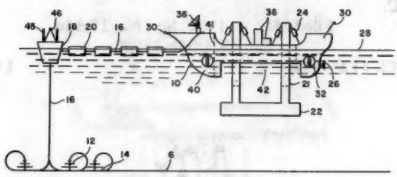
A knockdown, pontoon boat is described which may be easily assembled and disassembled. The boat is provided with high strength pontoons that may be dismantled for shipment and convenient storage. The pontoons are made of sections with a compression ring disposed between adjacent sections and means is provided for securing the individual members of the pontoon into a watertight unit.

3,664,286

OFFSHORE STORAGE SYSTEM

Preston E. Chaney, Dallas, Tex., assignor to Sun Oil Company, Dallas, Tex.

Filed Nov. 3, 1969, Ser. No. 873,291
Int. Cl. B63b *35/00*
U.S. Cl. 114—0.5 T **19 Claims**



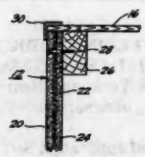
A buoyant vessel for storing offshore oil and gas production having a ballast compartment for stability which can be raised and lowered relative to the vessel. The ballast compartment is in a lowered position when the vessel is in its offshore location, and it is in a raised position flush with the hull of the vessel when the vessel is being moved to and from its offshore position. This vessel is used in cooperation with wells completed on the floor of a body of water with flexible flow lines and hydraulic lines attached from the vessel to the wells by way of a float located on the water surface. The production is processed on the vessel and stored therein with ballast and stored fluids manipulated to provide appropriate buoyancy for the vessel.

3,664,287

REINFORCED CONCRETE BOAT HULL AND METHOD OF CONSTRUCTION

Raymond A. Duff, 1333 South Baker, Santa Ana, Calif.

Filed Aug. 21, 1969, Ser. No. 851,961
Int. Cl. B63b *5/14*
U.S. Cl. 114—65 A **16 Claims**



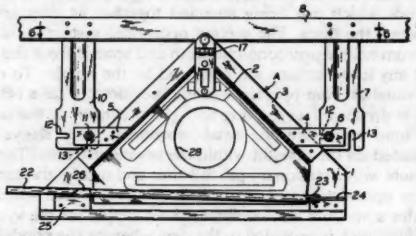
A boat having a concrete hull formed of a plurality of alternate, integrally bonded layers of concrete and fiber-reinforced epoxy resin, and a method of constructing a concrete and fiber-reinforced epoxy resin boat hull. The hull is a unitary structure comprised of a plurality of layers of concrete having an integrally bonded layer of fiber-reinforced epoxy resin interspaced between adjacent layers of concrete. The strength of the structure can be even further increased by the addition of a minor proportion of epoxy resin to the concrete.

3,664,288

FABRIC-HOLDING CLAMP FOR EMBROIDERY MACHINES

Alberto Weidlin Von Boden, Washington, D.C., and Ernest Enzian, Highland, N.Y., assignors to Countess Mara, Inc., New York, N.Y.

Filed Mar. 26, 1970, Ser. No. 22,818
Int. Cl. D05c *9/04*
U.S. Cl. 112—103 **3 Claims**



A fabric-holding means particularly adapted for embroidery machines, such as those which are used for applying initials, monograms or other designs to neckties or fabric pieces, the device comprising a pair of plates, which may be triangular is shape, with one of said plates hingedly attached to the other plate and between which plates the fabric piece is inserted and is clampingly held with a portion of the fabric piece in which the embroidering operation is to be performed, exposed in registered openings in the plates and below an embroidery needle. The plates are provided with compressible, non-slip areas which act to hold the fabric taut across the openings, and means is provided for pressing one of the plates down upon the other when the fabric piece is clamped between the plates. Guide means for directing the fabric pieces into the proper position are also provided.

3,664,289

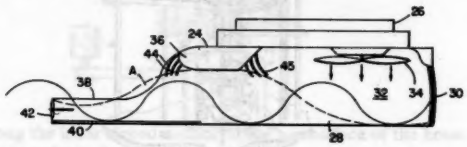
HYDRAULIC JUMP CAPTURED AIR BUBBLE VESSEL

Edward A. Boydston, 546 A Flordia Street, Vallejo, Calif.

Continuation-in-part of application Ser. No. 870,301, Dec. 22, 1969, now abandoned. This application Oct. 28, 1970, Ser. No. 84,601

Int. Cl. B63b *1/38*

U.S. Cl. 114—67 A 5 Claims



A water-borne air cushion vessel has an underwater driving means on its forward end which creates a hydraulic wave at a distance rearwardly therefrom. The wave produced provides at its crest a constant seal for the forward side of a cavity under the vessel wherein air is trapped to produce the cushioning effect that maintains the vessel above the nominal water level.

3,664,290

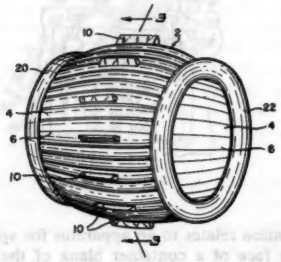
AQUATIC RECREATION DEVICE

Arthur F. Finn, 608 John Marshall Drive, N.W., Vienna, Va.

Filed Nov. 10, 1970, Ser. No. 88,396

Int. Cl. B63b *35/72*

U.S. Cl. 115—20 4 Claims



This aquatic recreational and exercise device is intended to be propelled over the surface of a body of water, and is part-spherical in shape having open ends and being of such dimensions that a person can stand, walk or run within it. The body of the device is formed of an annular series of buoyant segments each having an external outwardly extending paddle, and the device is propelled along and over the water by the operator walking or running within it in the direction he wishes to go, while a modification would allow for powered operation. An annular buoyant member is attached at each open end of the part-spherical body to provide stability.

3,664,291

RIBBON-TYPE GARAGE PARKING DEVICE

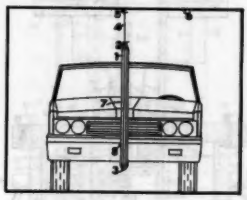
Paul C. Fritz, 1441 Colleen Lane, McLean, Va.

Filed Feb. 5, 1971, Ser. No. 112,886

Int. Cl. B60q

U.S. Cl. 116—28 1 Claim

This invention relates to an improved target and signaling device used for precise positioning of an automobile in a garage, and which is comprised of a high-visibility, draped, flexible ribbon suspended from the garage ceiling, weighted at the lower end to hold it taut, and located at the front of the desired parked position of the automobile.



3,664,292

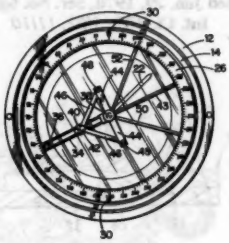
MAGNETIC COMPASS TACK HEADING INDICATOR

Allen Butman Sherman, Pembroke, Mass., assignor to E. S. Ritchie & Sons, Inc., Pembroke, Mass.

Filed Dec. 2, 1970, Ser. No. 94,285

Int. Cl. G01d *21/00*

U.S. Cl. 116—114 10 Claims



A navigational aid for use with a magnetic compass to set optimum tack headings to be taken when sailing upwind. The device fits over the transparent dome of a flat top or spherical compass and includes movable tack heading pointers and a bisecting wind heading pointer, the pointers all being rotatable about the compass card pivot point.

3,664,293

HOT DIP COATING APPARATUS

Shiro Hozumi, and Terukazu Kinugasa, both of Osaka-fu, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 24, 1970, Ser. No. 92,381

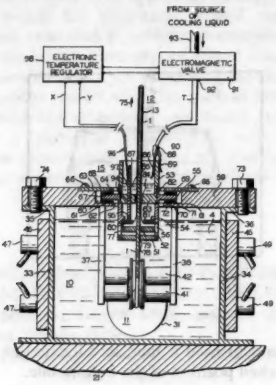
Claims priority, application Japan, July 8, 1970, 45/60423

Int. Cl. B05c *11/00*

U.S. Cl. 118—5 9 Claims

A hot dip coating apparatus for coating a metal wire or strip with a molten metal. A bath of molten metal has at least one guide member immersed therein. A cooling chamber is positioned above the guide member and has, at the bottom thereof, a bore through which the wire passes and also has a cooling liquid in the bottom thereof. A liquid supplier is attached to the cooling chamber, and a liquid level control means in the form of a monitor coupled to the liquid supplier keeps the liquid at a predetermined liquid level. The guide

member and the cooling chamber are combined in a unitary body. The wire coated with the molten metal is cooled by the



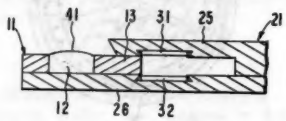
cooling liquid while passing through the bore while being guided by the guide member.

3,664,294

PUSH-PULL STRUCTURE FOR SOLUTION EPITAXIAL GROWTH OF III–V COMPOUNDS

Raymond Solomon, Sunnyvale, Calif., assignor to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed Jan. 29, 1970, Ser. No. 6,819
Int. Cl. B05c *5/02, 11/10*
U.S. Cl. 118—7 **6 Claims**



Epitaxial layers of III–V compounds are grown on the facing surfaces of a pair of parallel, spaced-apart wafers by forcing a small quantity of a solution saturated with a III–V compound between the wafers for a selected time. Lowering the temperature of the solution precipitates the III–V compound epitaxially onto the adjacent surfaces of the wafers.

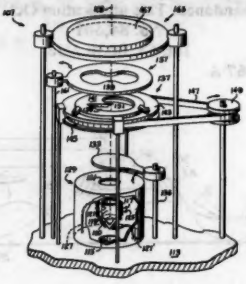
3,664,295

MEANS FOR ACHIEVING A CONTROLLED GRADIENT DENSITY COATING ON A LIGHT ATTENUATION MEDIUM

David M. Ng, and Charles H. Rehkopf, both of Seneca Falls, N.Y., assignors to GTE Sylvania Incorporated, Seneca Falls, N.Y.

Filed Nov. 2, 1970, Ser. No. 86,030
Int. Cl. C23c *13/08*
U.S. Cl. 118—9 **7 Claims**

Means and process are disclosed for disposing a patterned light attenuating coating of a differential density on a substantially transparent optical medium, used in the optical system for photo-forming the windowed interstitial web portion of a color cathode ray tube composite screen structure. The apparatus comprises a hermetic chamber wherein there is included a vaporizing source, a rotatable first pattern mask, a movable second pattern mask, support means for positioning the optical medium, and optical means for monitoring the deposition of coating thereon. The apparatus enables the deposition of a nonsymmetrical coating formed to



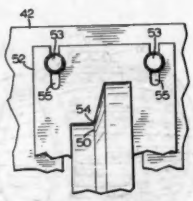
modify the photo-exposure illumination from the photo-exposure light source.

3,664,296

SEALING COMPOUND APPLICATOR

George Frederick Stamp, and Kenneth Allan Walker, both of London, Ontario, Canada, assignors to Somerville Industries Limited, London, Ontario, Canada

Filed Sept. 21, 1970, Ser. No. 74,063
Claims priority, application Canada, Aug. 25, 1970, 091,700
Int. Cl. B05c *1/08*
U.S. Cl. 118—246 **3 Claims**



This invention relates to an apparatus for applying sealant to the edge face of a container blank of the type used to package liquids such as milk. The principle of the invention is an applicator wheel that enters into a sealant pot and picks up a ribbon of sealant as its rotates. The edge of the container blank to be sealed is caused to engage with and pick up the ribbon of sealant on the wheel. A feature of the invention is the design of the sealant pocket of the applicator wheel which is adapted to place sealant on the edge face only of the container blank.

3,664,297

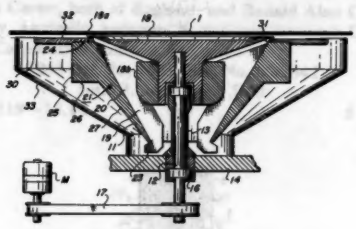
CENTRIFUGAL DEVELOPMENT APPARATUS AND METHOD

Daniel J. Donalies, Rochester, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Filed Aug. 29, 1969, Ser. No. 854,083
Int. Cl. G03g *13/08*
U.S. Cl. 118—627 **26 Claims**

An apparatus for developing an electrostatic latent image which includes a housing rotatable about an axis for conveying developer to the image. The housing includes a sloped inner surface which increases in distance from the axis in an upward direction and includes a top surface which lies in a plane substantially perpendicular to the axis to confront an

electrostatic image to develop. Rotation of the housing centrifugally impels developer from the bottom of the housing



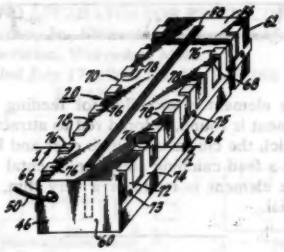
along the inner sloped surface to the top surface of the housing in order to develop the image.

3,664,298

MANIFOLD FOR FOUNTAIN-TYPE LIQUID DISPENSER

Edward Charles Glaimo, Jr., Princeton, N.J., assignor to RCA Corporation

Filed Mar. 26, 1970, Ser. No. 22,911
Int. Cl. G03g 13/00
U.S. Cl. 118—637 8 Claims



In an electrostatic printing machine, a manifold for applying liquid developer to an adjacent recording element comprises an elongated body of electrically conductive material. An exit slit, formed in the top surface, serves to direct the liquid developer to the recording element. A plurality of spaced-apart ridges extend upwardly from the top surface, adjacent side edges thereof, and form a plurality of spaced-apart slots between adjacent ridges, respectively, so that liquid developer that is pumped through the exit slit can flow off the top surface via the slots, in a direction perpendicular to the exit slit.

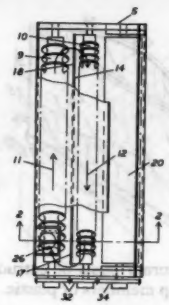
3,664,299

ELECTROSTATIC RECORDING PAPER TONER SECTION

David Shaler, Madison, and Ralph A. Varrichio, Morristown, both of N.J., assignors to EG&G Inc., Bedford, Mass.

Filed Dec. 7, 1970, Ser. No. 95,842
Int. Cl. G03g 13/00
U.S. Cl. 118—637 9 Claims

A toner section is provided incorporating a pair of auger members moving a toner and iron filing mixture past the surface of the magnetic brush roller in which the toner mixture adheres to the magnetic brush roller at a desired thickness pursuant to the action of a stripper blade. Entrance means is provided to receive toner directly into the toner compartment where it is mixed with the iron filings and conveyed to the magnetic brush roller.

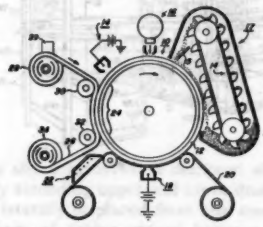


3,664,300

APPARATUS FOR TREATING THE SURFACE OF AN ELECTROSTATOGRAPHIC IMAGING

Robert John Joseph, Penfield, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Original application Nov. 14, 1966, Ser. No. 594,249, now Patent No. 3,501,294. Divided and this application Sept. 2, 1969, Ser. No. 870,872
Int. Cl. B05c 1/14, 1/08
U.S. Cl. 118—637 8 Claims



Apparatus for treating a surface of an electrostatographic imaging plate with a solid hydrophobic metal salt of a fatty acid comprising an electrostatographic imaging plate having a recyclicable imageable surface, means to support the imaging plate, fibrous treating means positioned adjacent to the imageable surface for pressure contact with the imageable surface, the fibrous treating means carrying on an outer surface thereof a transferable solid hydrophobic metal salt of a fatty acid and adapted to treat the imageable surface, and means to cause relative motion between the fibrous treating means and the imageable surface.

3,664,301

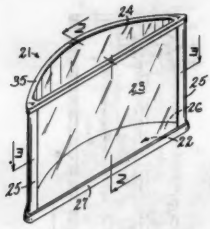
AQUARIUM

Ralph C. Morrill, 950 Benham Street, Hamden, Conn.

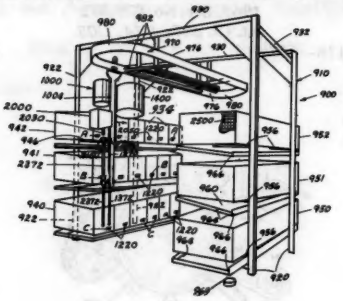
Filed Oct. 12, 1970, Ser. No. 79,891
Int. Cl. A01k 63/00
U.S. Cl. 119—5 10 Claims

In an aquarium tank having a concave mirror as at least a portion of its rear wall, the distortion of images of fish and other objects in the water of the aquarium is prevented by positioning the front, transparent wall such that objects in the tank are confined between the principal focal point of the

mirror and the surface of the mirror. The strength of the aquarium and its resistance to soiling and corrosion is improved by providing corner posts of extruded aluminum alloy, and bottom and top members of plastic.



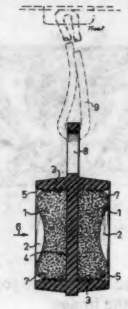
3,664,302
LACTATION PERIOD BROODER
Lloyd C. Wienert, Pappillion, Nebr., assignor to Wilson & Co., Inc., Chicago, Ill.
Continuation of application Ser. No. 672,082, Oct. 2, 1967, now abandoned. This application Feb. 10, 1971, Ser. No. 114,364
Int. Cl. A01k *05/00, 09/00*
U.S. Cl. 119—18 **27 Claims**



A liquid animal feeder comprising compartments in which there are no openings during operation through which a pig less than three weeks old can extend its entire head, the liquid animal feeder having a moving feed delivery unit deliverying food to a row of compartments at feed delivery positions at least sufficiently close to the inner side of each compartment that pigs less than three weeks old can drink from said positions, the liquid animal feeder having means making possible delivery of feed to vertically spaced rows or compartments from the same feed delivery unit, such unit being mounted on a track having a straight side for serving a straight row of compartments, the quantity of feed delivered at each compartment being selectively controllable by convenient control means.

3,664,303
FISH FOOD HOLDER
Ulrich Baensch, Herrenteich 70, 452 Melle, Germany
Filed June 17, 1970, Ser. No. 46,869
Claims priority, application Germany, June 24, 1969, G 69 25 057.3
Int. Cl. A01k *61/02*
U.S. Cl. 119—51 **8 Claims**

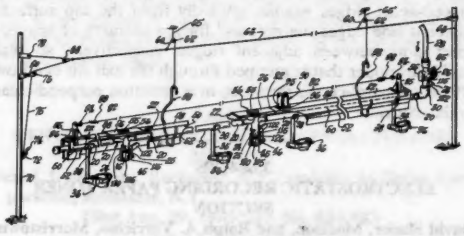
A fish food holder for aquariums with one or more recesses provided in the lower portions of a non-floatable body while the upper portion of said body includes suspension means for suspending said fish food holder at a desired height.



3,664,304
CHICK FEEDER
Allie F Carter, 822 Olde Hickory Road, Lancaster, Pa.
Filed Nov. 19, 1969, Ser. No. 877,891
Int. Cl. A01k *5/00, 39/00*
U.S. Cl. 119—61 **6 Claims**

A dish-like element is provided for feeding chicks. The dish-like element is round, colored red to attract the chicks, has a rim which the chicks can climb over and has a groove in the rim as a feed catching and supplemental feed trough. The dish-like element is made of a very thin, inexpensive plastic material.

3,664,305
EXTENDIBLE WATERING SYSTEM FOR FOWLS
Harold W. Hart, and Warren H. Hart, both of Glendale, Calif., assignors to H. W. Hart Mfg. Co., Glendale, Calif.
Filed Dec. 29, 1969, Ser. No. 888,594
Int. Cl. A01k *07/00*
U.S. Cl. 119—72 **36 Claims**



A pipeline comprises plastic pipe lengths interconnected by plastic couplings with telescoped joints and with plastic valves in each coupling. The pipeline is enclosed and supported by an adjustably suspended sheet metal housing assembly with a charged wire thereon to keep off fowls.

3,664,306

APPARATUS FOR THE DETECTION OF MASTITIS IN MILK ANIMALS

Joshua Creer Quayle, Teesside; Graham Roland Greatrix, Seaton Carew, both of England, and Ronald Alan Coombe, Bentley, Australia, assignors to National Research Development Corporation, London, England

Filed Oct. 23, 1969, Ser. No. 868,841
Int. Cl. A01j 3/00, 5/00
U.S. Cl. 119—14.14 5 Claims

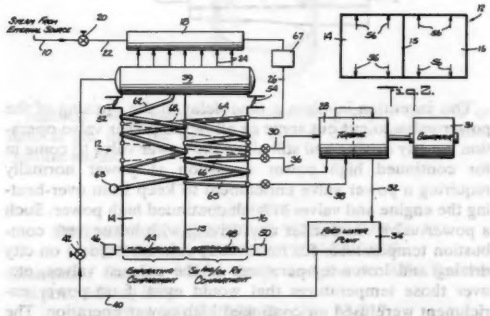
A method and apparatus are described for detecting mastitis in milk animals. Milk from different teats of the animal is passed through conductivity cells and if the conductance of the milk from one teat is different from that of milk from other teats a mastitis infection is likely. A convenient method of comparing conductances using an electrical bridge is described, as is a suitable conductivity cell.

3,664,307

METHOD AND APPARATUS FOR PRODUCING STEAM

Albert H. Rawdon, Jr., Shrewsbury, Mass., assignor to Riley Stoker Corporation, Worcester, Mass.

Filed July 17, 1969, Ser. No. 842,460
Int. Cl. F22b 33/00
U.S. Cl. 122—1 6 Claims



This invention relates to a method and apparatus for producing steam utilizing an external irregular supply source such as an incinerator plant, a waste boiler, a nuclear plant, etc., combined with a twin furnace having a first evaporator compartment and a second superheater and reheating compartment.

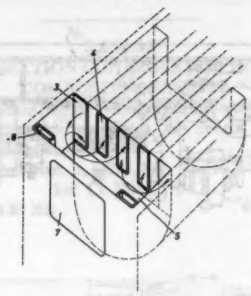
3,664,308

BOILERS

Hans Viessmann, Battenberg, Eder Im Hain, Germany

Filed Nov. 26, 1969, Ser. No. 880,317
Claims priority, application Germany, Nov. 28, 1968, P 18 11 349.4; Aug. 28, 1969, P 19 43 761.7
Int. Cl. F22b 7/12
U.S. Cl. 122—149 6 Claims

A boiler for use with liquid or gaseous fuels. Return flow of combustion gases takes place within the combustion chamber itself by means of one or more passageways formed in the walls of the combustion chamber. A plurality of gas flues are positioned alongside the passageways, and this face permits a



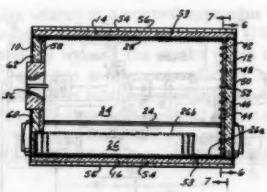
ready transfer of gases from the passageways into the flues. Thus, the volume of the combustion chamber depends solely on the combustion of the fuels and a compact, efficient boiler results.

3,664,309

PACKAGE STEAM GENERATOR

Richard W. Seelinger, East Stroudsburg, Pa., assignor to Ovitron Corp., Newburgh, N.Y.

Filed Mar. 13, 1970, Ser. No. 19,168
Int. Cl. F22b 21/34
U.S. Cl. 122—336 3 Claims



A package steam generator is disclosed which comprises longitudinally extending upper and lower drums having their center lines laterally displaced from one another. First and second sections of tubing extend between the drums to define therebetween a furnace area for heating the fluid in the tubing. The tubes are of substantially equal length in both tubing sections to provide substantially uniform fluid circulation between the drums, thereby to prevent unequal heating and failure of the tubing.

3,664,310

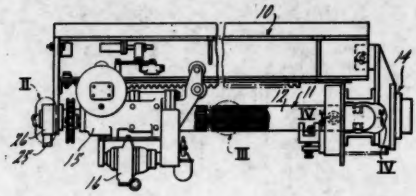
FLUID PROJECTION APPARATUS FOR CLEANING HEAT EXCHANGERS

James W. Locke, Sr., and John C. Goeller, III, both of Lancaster, Ohio, assignors to Diamond Power Specialty Corporation, Lancaster, Ohio

Continuation of application Ser. No. 16,291, Mar. 4, 1970, now abandoned. This application May 3, 1971, Ser. No. 139,883
Int. Cl. F22b 37/48
U.S. Cl. 122—379 6 Claims

A combined soot blower and liquid projector for cleaning boiler surfaces has a main lance tube telescopically overfitted on a feed tube and carrying a nozzle assembly at its outer end for projecting steam and/or air supplied through said tubes, a second pair of telescoped tubes inside and substantially smaller in diameter than the two tubes first mentioned and including a slidable liquid lance having a jet member con-

nected to the nozzle assembly to discharge liquid at right angles to the stream or air. During projection of liquid, steam



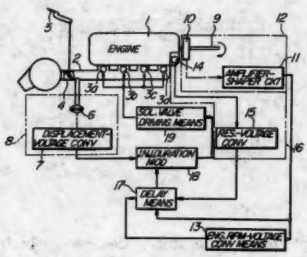
and/or air is supplied to the outer tubes to cool them and the nozzle assembly.

3,664,311

FUEL INJECTION CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE

Kunio Endo, Anjo-shi, Japan, assignor to Nippondenso Kabushiki Kaisha, Kariza-shi, Aichi-ken, Japan

Filed Dec. 30, 1969, Ser. No. 889,064
Claims priority, application Japan, Jan. 21, 1969, 44/4213
Int. Cl. F02m *51/00*
U.S. Cl. 123—32 EA **1 Claim**



A fuel injection control system for internal combustion engines wherein an injection reference signal synchronized with the rotation of the engine and in advance of the valve opening times of the inlet valves is produced and the signal is then delayed such that a fuel injection duration modulator for driving the fuel injection solenoid valves is actuated by said delayed signal, while said delay time is controlled by means of signals corresponding to the temperature of the engine and the engine rpm, whereby the fuel injection starting time is changed according to variations in the engine temperature thereby achieving excellent starting characteristics and the optimum rate of fuel consumption.

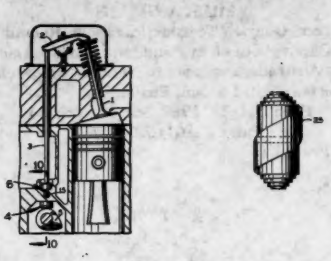
3,664,312

THERMO-COMPENSATING VALVE LIFTER FOR INTERNAL COMBUSTION ENGINES

Lloyd E. Miller, Jr., 8330 S. W. 52nd Avenue, Miami, Fla.

Filed June 25, 1970, Ser. No. 49,724
Int. Cl. F01l *1/14, 1/00, 1/22*
U.S. Cl. 123—90.19 **6 Claims**

A valve lifter for an internal combustion engine embodying a screw member rotated by a thermally responsive control element for holding predetermined clearance in a valve train substantially constant over a relatively wide temperature



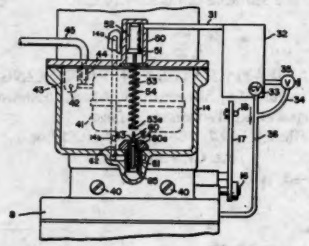
gradient and including means for positively conducting pressurized lubricant to the entire train.

3,664,313

CARBURETOR

Brooks Walker, 1280 Columbus Avenue, San Francisco, Calif.

Filed Feb. 24, 1970, Ser. No. 13,550
Int. Cl. F02m *13/04*
U.S. Cl. 123—119 R **12 Claims**



This invention involves a time delay in the opening of the power valve to cut out some or all of the power valve operation for city driving and still allow the power valve to come in for continued high power operation at power normally requiring a power valve enrichment to keep from over-heating the engine and valves at such continued high power. Such a power valve cut out for city driving with lower peak combustion temperatures for lower NO_x (nitrous oxides) on city driving and lower temperatures of the exhaust valves, etc. over those temperatures that would exist if no power enrichment were used on continued high power operation. The method of timing the delay in power valve come in is by the use of a reservoir between the intake suction and the power valve piston with a check valve to hold suction in the reservoir and a very limited bleed down for delayed reduction of suction to operate the power valve.

3,664,314

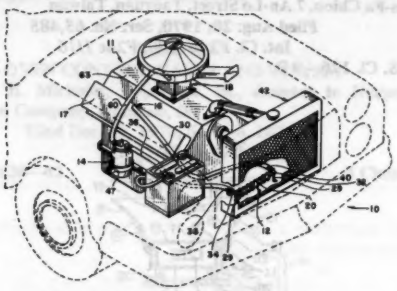
CRANKCASE VAPORS CONDENSOR

Clifford L. Lamkin, 1602 Mills, Wichita, Kans.

Filed Mar. 9, 1970, Ser. No. 17,466
Int. Cl. F02f *9/00*
U.S. Cl. 123—119 B **3 Claims**

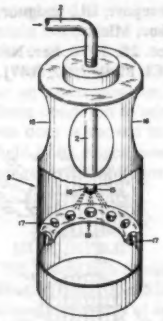
This invention is a crankcase vapors condensor for a vehicle having an internal combustion engine with a crankcase, a positive crankcase ventilation valve, intake manifold carburetor, and associated cooler. The invention includes a special condensor operably connectible with the positive crankcase

ventilation valve to receive crankcase vapors, condense same, and pass to a special separator operable to remove and



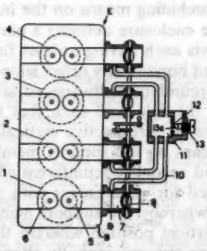
retain the resulting condensate, and pass resulting vapors to the intake manifold of the engine.

3,664,315
LP-GAS RAM-AIR CHARGER
John B. Kramer, Houston, Tex., assignor to Allied Chemical Corporation, New York, N.Y.
Filed Mar. 16, 1970, Ser. No. 19,950
Int. Cl. F02n *21/04*
U.S. Cl. 123—120 **4 Claims**



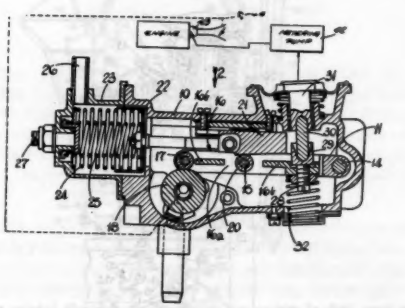
Method and apparatus for introducing vapor of LPG or natural gas into the air intake system of an internal combustion engine.

3,664,316
DEVICE FOR ADJUSTING THE IDLING IN AN INTERNAL COMBUSTION ENGINE
Giampaolo Garcea, Milan, Italy, assignor to Alfa Romeo S.p.A., Milan, Italy
Filed July 8, 1970, Ser. No. 53,217
Claims priority, application Italy, July 15, 1969, 19,672 A/69
Int. Cl. F02m *23/04*, *13/04*
U.S. Cl. 123—124 R **5 Claims**



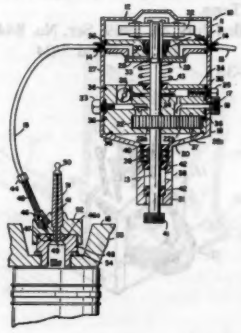
The regulation of the idle speed of an internal combustion engine under no-load conditions is effected by a compensating chamber which communicates with the intake ducts of the several cylinders of the engine. Manual adjustment means (such as a screw) is used to adjust the flow passage area in the small ducts until a satisfactory adjustment is achieved.

3,664,317
FUEL INJECTION CONTROLS FOR INTERNAL COMBUSTION ENGINES
Jack Skinner, and George Whitehurst, both of Solihull, Warwickshire, England, assignors to Simms Motor Units Limited, London, England
Filed Mar. 3, 1970, Ser. No. 16,141
Int. Cl. F02d *1/04*
U.S. Cl. 123—139 BG **9 Claims**



The invention relates to a control apparatus for an internal combustion engine fuel injection system. The control apparatus operates by varying the stroke of an associated metering device, and has a lever movable by a cam plate in response to the engine inlet manifold pressure. The lever is also movable by a further cam coupled to the engine throttle control, whereby the amount of fuel supplied to the engine is dependent both on manifold depression and throttle position.

3,664,318
FUEL INJECTION SYSTEM
William E. Giuffra, 1111 Buena Vista Drive, Jackson, Calif.
Filed Oct. 28, 1970, Ser. No. 84,805
Int. Cl. F02m *39/00*
U.S. Cl. 123—139 AL **10 Claims**



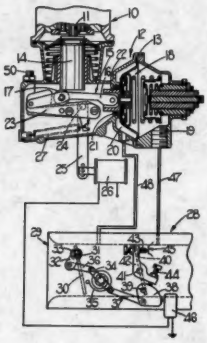
A fuel injection system for injecting fuel into either a two or four cycle internal combustion engine including a housing having a drive shaft with fuel pumping means for pumping

fuel through a distributing section into fuel injectors associated with the combustion chambers of the engine. At the fuel injectors, the fuel is atomized, mixed with air and ignited before being passed into the combustion chambers.

3,664,319
INTERNAL COMBUSTION ENGINE GASOLINE INJECTION SYSTEM

Derek Channing, Farmington, Mich., assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Jan. 27, 1970, Ser. No. 6,191
Int. Cl. F02d 1/04
U.S. Cl. 123—140 MC **1 Claim**

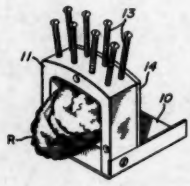


The invention relates to a gasoline injection system for an internal combustion engine. A control stop for a shuttle-type metering pump is responsive to a cam follower movable by a diaphragm. The diaphragm is in turn responsive to the pressure drop across the engine intake throttle. An airflow control device is carried in the intake, upstream of the throttle. The control device is operable by an element sensitive to engine temperature to reduce the pressure drop and thereby increase fuel supply at low temperatures. A cam track engaged by the cam follower is energizable during engine starting to further increase the fuel supply.

3,664,320
CONTOUR VISE

Mary E. Allen, and Harry W. Allen, both of Lee Pike, R.R. #1, Soddy, Tenn.

Filed July 23, 1969, Ser. No. 844,109
Int. Cl. B28d 7/04
U.S. Cl. 125—35 **5 Claims**

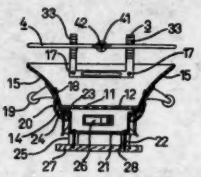


A device for holding irregular objects to enable a fixed frame of reference for an object, irrespective of its contour, and including a frame and differentially positioned, angularly related, clamping elements.

3,664,321
DISMOUNTABLE HIBACHI CONSTRUCTION

Jia-Fa Chiou, 7 An-Lo Street, Taoyuan, Taiwan

Filed Aug. 20, 1970, Ser. No. 65,485
Int. Cl. F24b 3/00; F24c 1/16
U.S. Cl. 126—9 R **3 Claims**

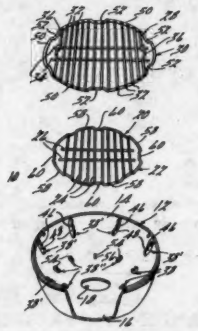


A hibachi (e.g., a picnic barbecue roaster) comprising a body portion and a base portion. The latter can easily be disassembled from the body portion and placed inside the body portion for reducing packaging dimensions.

3,664,322
BARBECUE GRILL ASSEMBLY

Robert H. Clark, Freeport, Ill., assignor to King-Seeley Thermos Co., Ann Arbor, Mich.

Filed Dec. 28, 1970, Ser. No. 101,455
Int. Cl. F24b 3/00; A47j 37/00
U.S. Cl. 126—25 A **12 Claims**



A barbecue grill assembly comprising a bowl-like enclosure having a generally circular peripheral side wall and adapted to contain a bed of combustible fuel; an annular article support member disposed interiorly of the enclosure, means for vertically adjustably supporting the member within the enclosure including means on the inner periphery of the side wall of the enclosure defining a plurality of step-shaped support elements each having at least first and second vertically spaced and horizontally offset support surfaces, the elements being circumferentially spaced around and projecting inwardly from the side wall such that the first and second support surfaces lie in respective vertically spaced, horizontal planes, and means on the support member defining radially spaced first and second circumferentially staggered support portions adapted for engagement with selective of the support surfaces, whereby the support member may be rotated from a first vertical position wherein the first support portions thereof are circumferentially aligned with and adapted to bear upon the first support surfaces of the elements, to a second position vertically offset from the first position

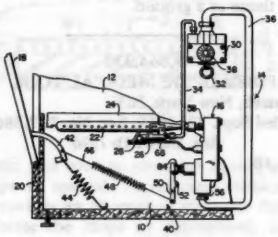
wherein the second support portions of the member are circumferentially aligned with and adapted to bear upon the second support surfaces of the elements.

3,664,323

OVEN CONTROL VALVE AND SYSTEM

Leonard H. Michaels, Naperville, Ill., assignor to Harper-Wyman Company, Hinsdale, Ill.

Filed Dec. 29, 1970, Ser. No. 102,282
Int. Cl. F24c 3/12
U.S. Cl. 126—42 8 Claims



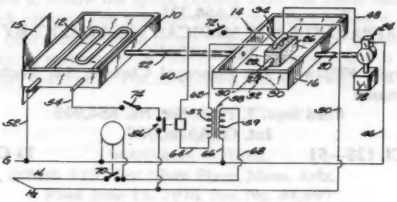
An oven control system and control valve for use with a gas oven including a main burner and a pilot burner serve to prevent operation of the oven when the oven door is opened. In normal operation, with the oven door closed, a valve member is moved to an open position in response to a predetermined pilot flame condition to admit gas to the main burner. When the oven door is moved to an open position, the valve member is held in its closed position to block flow to the main oven burner regardless of pilot flame condition.

3,664,324

HUMIDIFIER

Herbert W. Radtke, 3755 South 20th Street, Milwaukee, Wis.

Continuation of application Ser. No. 5,628, Jan. 26, 1970, now abandoned, Continuation-in-part of application Ser. No. 868,501, Oct. 22, 1969, now abandoned. This application May 5, 1971, Ser. No. 140,599
Int. Cl. F24f 3/14
U.S. Cl. 126—113 8 Claims



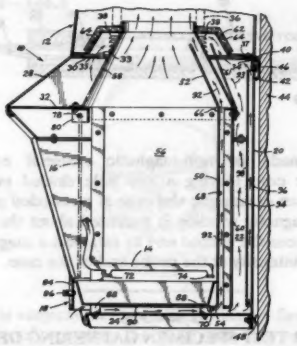
A portable humidifier including an evaporator pan adapted to be mounted in the plenum of a furnace, a heating element in the evaporator pan connected to the furnace motor circuit, a reservoir mounted at a point remote from the evaporator pan and at the same level, a conduit connecting the reservoir to the evaporator, a source of water connected to the reservoir through a restricted conduit, a solenoid actuated control valve connected to control the flow of water through the restricted conduit and a double acting mercury switch mounted on a float in the reservoir to control the operation of the solenoid valve and to disable the heating element when the water in the evaporator pan drops below the heating element.

3,664,325

SHEET METAL FIREPLACE

Dannie O. Malafouris, 7945 N.E. Alberta Street, Portland, Oreg.

Filed July 8, 1970, Ser. No. 53,193
Int. Cl. F24b 1/18
U.S. Cl. 126—121 9 Claims



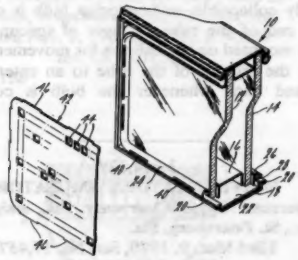
A sheet metal fireplace comprises an outer jacket and a firebox mounted in and spaced from the jacket. The jacket and firebox have open fronts. The firebox has a flue opening at the top. A grate is mounted near the bottom of the firebox. A draft passageway is located beneath the grate and communicates with the space between the back walls of the jacket and firebox. A vertical baffle is present in this space. The baffle provides two vertical passageways. The inner passageway adjacent the firebox back wall circulates cool air behind the same and discharges it through the flue. The outer passageway behind the baffle circulates heated air into the room through appropriately located louvers.

3,664,326

SAFETY SCREEN FOR OVEN WINDOWS

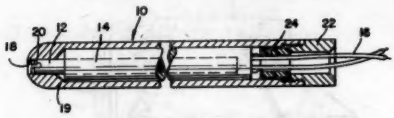
Vernon I. Mills, Bloomfield Hills, Mich., assignor to Mills Products, Inc., Farmington, Mich.

Filed Mar. 18, 1971, Ser. No. 125,558
Int. Cl. F23m 7/00
U.S. Cl. 126—200 3 Claims



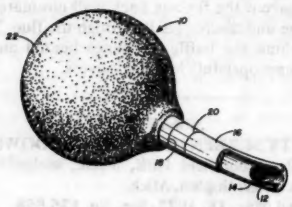
A decorative safety screen for use with a window unit in an oven door comprises a flat sheet of perforated flexible material removably mounted in spaced parallel relation in front of the outer one of the two glass panels of the window unit.

3,664,327
MAGNETIC PROBE
Reuben H. Gordon, Holly Hill Plaza, 2321 Peach Orchard Road, Augusta, Ga., and Ivan H. Brown, 304 Bloomfield Road, Sebastopol, Calif.
Continuation-in-part of application Ser. No. 845,184, July 28, 1969, now abandoned. This application Nov. 27, 1970, Ser. No. 93,264
Int. Cl. A61b 17/52
U.S. Cl. 128—1.4 8 Claims



A case made of non-magnetic material encloses a paramagnetic core leaving a key hole slotted end closely spaced from an opening in the case at a rounded probe end. An electromagnetic winding is mounted about the core axially spaced from the slotted end to establish a magnetic field of maximum intensity at the probe end of the case.

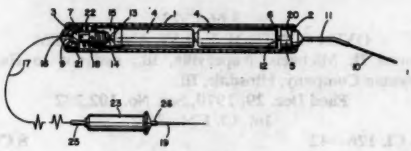
3,664,328
CANCER TEST SPECIMEN GATHERING DEVICE
Henry Dinwoodey Moyle, Jr., 5600 Holladay Blvd., Salt Lake City, Utah, and William Bates, 4700 Idlewild Circle, Salt Lake City, Utah
Continuation of application Ser. No. 810,299, Mar., 1969, now abandoned. This application Apr. 28, 1971, Ser. No. 138,323
Int. Cl. A61b 10/00
U.S. Cl. 128—2 B 1 Claim



A cervical cancer test specimen gathering device for use in the home. The device includes an insertion tube and a sampling balloon normally collapsed within one end of the tube. A manually collapsible, self-restoring bulb is connected to the other end of the tube. A layer of specimen gathering material is mounted on the balloon for movement by the balloon from the interior of the tube to an exterior sampling position and back whenever the bulb is collapsed and released.

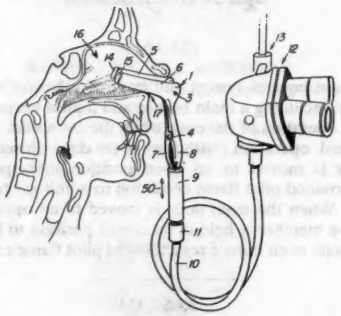
3,664,329
NERVE LOCATOR/STIMULATOR
Richard Norman Naylor, Clearwater, Fla., assignor to Concept, Inc., St. Petersburg, Fla.
Filed Mar. 9, 1970, Ser. No. 17,457
Int. Cl. A61f 5/00
U.S. Cl. 128—2.1 R 2 Claims

A self contained, portable, disposable, self testing and self powered instrument for use in medical procedures to stimulate nerves and to determine if the tissue in question is a muscle controlling nerve, by delivering a maximum of 2 milliamperes of current through human tissue in the general area to be probed by an insertion of a probe electrode (negative) in subcutaneous tissue after an incision has been made



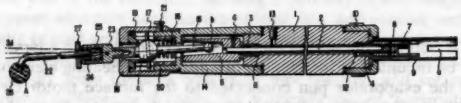
and implanting a needle (positive electrode) anywhere in subcutaneous tissue as a ground.

3,664,330
FIBER OPTIC MEDICAL TOOL
Harold L. Deutsch, New York, N.Y.
Filed Sept. 12, 1969, Ser. No. 857,386
Int. Cl. A61b 1/06
U.S. Cl. 128—18 17 Claims



A medical tool, preferably taking the form of a speculum, wherein fiber optics are carried by the distal ends of members which extend into a body orifice to provide visualization and illumination of the body area interior of the orifice. Manipulative access is provided to the area within the orifice between the inner surfaces of the spread apart members of the speculum-type tool which extends into the orifice.

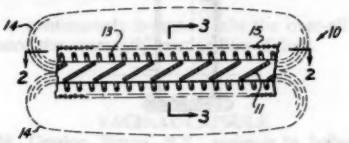
3,664,331
APPARATUS FOR MEDICAL TREATMENT BY VIBRATIONS
Gheorghe Filipovici, str. Episcopul Chesare, 12, Bucharest, Romania
Filed Sept. 3, 1969, Ser. No. 854,905
Int. Cl. A61h 7/00
U.S. Cl. 128—51 11 Claims



A device for the medical treatment of organic tissues by vibrations having a lever with two opposite ends and a longitudinal axis between them, and a bumper rigidly attached to one end of the lever, the lever being mounted for universal pivoting movement and for limited movement in the

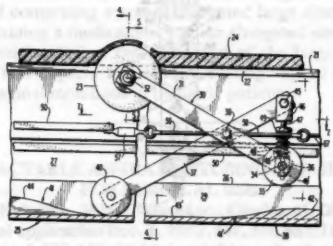
direction of its longitudinal axis. The end of the lever opposite to the end at which the bumper is mounted is arranged to engage a rotating eccentric cavity when pressure is put on the bumper.

3,664,332
THERAPEUTIC VIBRATING PAD
Luigi Vecchio, 6003 Fair Avenue, North Hollywood, Calif.
Filed Mar. 18, 1970, Ser. No. 20,720
Int. Cl. A61h *24/00*
U.S. Cl. 128—24.2 **11 Claims**



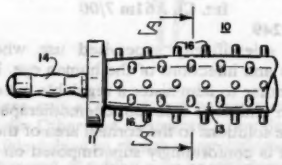
A therapeutic pad with an armature having a plurality of extended strips in spaced, overlapping relation. Magnetic field means provides an alternating magnetic field in the armature to vibrate the strips by successively inducing and removing magnetic flux into each strip so that adjacent strips successively pull together and relax.

3,664,333
MASSAGE TABLE
Menno E. Hill, 806 Harbor Island, Clearwater, Fla.
Filed Feb. 8, 1971, Ser. No. 113,308
Int. Cl. A61h *7/00*
U.S. Cl. 128—52 **14 Claims**



A massage table which features a traversing roller or series of rollers to follow the spinal column from the lower back to the neck region. The massage roller or rollers follow a contoured cam means which produce the desired rise and fall at the various regions of the back. The massage roller is also resiliently cushioned. The machine is self-reversing.

3,664,334
MASSAGE WHEEL
John J. O'Neil, 513 West Ninth Place, Mesa, Ariz.
Filed June 15, 1970, Ser. No. 45,997
Int. Cl. A61h *15/00*
U.S. Cl. 128—57 **2 Claims**



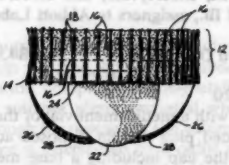
A massage wheel consisting of a cylinder having a plurality of prongs protruding from its circumference to which is attached an axle on either end which serve as handle grips for manipulation of the wheel over the body surface for massage purposes.

3,664,335
SURGICAL FACE MASK
Wilfred M. Boucher, Fanwood, N.Y.; John Kurilla, Doylestown, Pa., and Alice C. Slepp, Teaneck, N.J., assignors to International Paper Company, New York, N.Y.
Filed Feb. 24, 1970, Ser. No. 13,507
Int. Cl. A62b *23/02*
U.S. Cl. 128—146.6 **1 Claim**

Disposable surgical face mask comprising a flexible porous pad capable of covering the nose and the mouth of the wearer, the flexible porous pad having an inner layer of non-woven fiber material, an outer layer of non-woven fiber material, and a central layer of filter material. The three layers are stitched together along their horizontal and vertical edges. An elastic binding is secured onto each vertical edge of the flexible porous pad. The flexible porous pad has a first vertical double pleat structure and a second vertical double pleat structure. The first and second vertical double pleat structures are parallel to one another and are spaced a horizontal distance from one another. Each of the vertical double pleat structures is formed by folding the flexible porous pad back on itself a first time and then folding it back on itself a second time thereby forming a "Z" or reverse "Z." A flexible nose strip and a foam strip are situated along the upper horizontal edge of the flexible porous pad. Binding tapes are stitched into the horizontal edges of the flexible porous pad.

The vertical double pleat structures form a cavity on the inner side of the flexible porous pad. When the frontal face of the flexible porous pad is extended outwardly, the vertical double pleat structures expand and provide a semirigid box structure.

3,664,336
DISPOSABLE ATHLETIC SUPPORTER
Brenda B. Gelston, Woodbark Lane, Phoenix, Md.
Filed Nov. 5, 1969, Ser. No. 874,339
Int. Cl. A61f *5/40*
U.S. Cl. 128—158 **7 Claims**



Wear-and-discard athletic supporters of non-woven material which has preferential directions of strength and resilience at right angles, are described, the circumference of the athletic supporter waistband being the strength-oriented

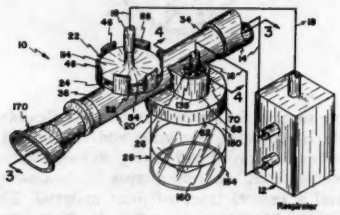
direction of the material, which is also gathered into pleats by circumferential elastic stitching, and the direction of resilience of the material being the suspensory direction; ventilated double waistbands and integral pouch and waistband construction further characterize embodiments of the invention.

3,664,337

RESPIRATION ASSEMBLY AND METHODS

Joseph W. Lindsey, and Larry O. Murphy, both of Salt Lake City, Utah, assignors to Bio-Logics, Inc., Salt Lake City, Utah

Filed Apr. 15, 1970, Ser. No. 28,887
Int. Cl. A61m 11/00
U.S. Cl. 128—194 12 Claims



A respiration assembly and methods, the assembly comprising only a few nebulizing and exhalation valve components, force-fit together and disposable after short usage. Air is delivered during the inspiration phase of the respiration cycle from a conventional respirator to the assembly in the form of a low pressure main stream flow and a high pressure nebulizing flow, the exhalation valve being closed by distending an expandable bladder under pressure. Nebulization occurs by discharging the high pressure flow through a constriction causing fluid from a cup reservoir to be siphoned to the site of discharge where shearing action of the effluent air against the liquid results in an aerosol of small liquid particles. The aerosol is further broken up by a baffle, disposed immediately downstream of the orifice within the cup reservoir. The aerosol is purged from the cup reservoir and carried to and mixed with the main stream air flow by diverting a portion of the main stream flow through the cup. During the expiration phase of the respiration cycle, no air flow occurs, the exhalation valve is open and the pressure and spent air within the assembly vents to the atmosphere.

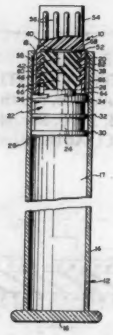
3,664,338

CAP FOR A MEDICAMENT VIAL

Kenneth H. Knox, Libertyville, and Robert J. Ries, Waukegan, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Oct. 28, 1970, Ser. No. 84,851
Int. Cl. A61m 5/00
U.S. Cl. 128—220 10 Claims

A cap for use with a medicament vial of the type having an externally threaded plug therein disposed adjacent an open mouth thereof, the cap including a base member, an internally threaded cylindrical wall extending from an inner surface of the base member and threadedly engaging the externally threaded plug, a grip extending from an outer surface of the base member, an annular rib projecting from the inner surface of the base member and abutting a contact surface at the end of the plug to provide a seal therefore, and a skirt extending from the internally threaded cylindrical wall to



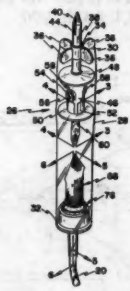
prevent deformation of the externally threaded portion of the plug.

3,664,339

DRIP CHAMBER AND METHOD

Louis S. Santomieri, 345 West M St., Benecia, Calif.

Filed Apr. 9, 1970, Ser. No. 27,040
Int. Cl. A61m 05/16
U.S. Cl. 128—214 C 5 Claims



A drip chamber having a flexibly resilient sleeve with memory and one-way inlet and outlet valves in each end of the sleeve, the valves respectively being in communication with a fluid source and an infusion tube. A control unit can be finger-actuated to determine a continuous drip at a constant rate from the inlet to the outlet valve. The method includes squeezing the sleeve to force fluid through the outlet valve into the infusion tube and thereafter allowing the sleeve to expand to draw fluid through the inlet tube into the sleeve.

3,664,340

SCLERAL LENS WITH ATTACHED TUBE

Loran B. Morgan, 138 Linda Vista, Torrington, Wyo.

Filed Oct. 17, 1969, Ser. No. 867,198
Int. Cl. A61m 7/00
U.S. Cl. 128—249 1 Claim

Means for scientifically supervised use when treating severe injuries and infections of the human eye. It enables a doctor or his nurse to administer a regulable but constant instillation of an antibiotic solution, chemotherapeutic agents, steroids or like solutions to the corneal area of the eyeball. A molded shield is conformingly superimposed on the eyeball and embodies a centralized concavo-convex corneal lens surrounded by a rim-like annulus which resides conformingly

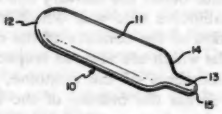
atop the sclera. Flexible tubing delivers the solution from a solution feeding bottle to the annulus in a manner that the

eyeball is continuously lavaged while the over-all shield "floats" atop the constantly existing film of fluid.

3,664,341
VAGINAL CAPSULE

Harry W. Gordon, Bronx, N.Y., assignor to Julius Schmid, Inc., New York, N.Y.

Filed Dec. 24, 1970, Ser. No. 101,285
Int. Cl. A61f *15/00*
U.S. Cl. 128—271 **3 Claims**

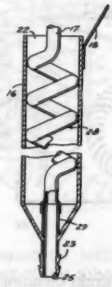


A water soluble cylindrically shaped vaginal capsule is described comprising a sealed elongated large diameter portion containing a medicament and an elongated small diameter portion located at the distal end of the large diameter portion. This capsule is useful in treating vaginal infections such as vaginal moniliasis in pediatric patients.

3,664,342
RETRACTABLE ASPIRATOR TUBING AND SHEATH FOR SURGICAL USE

Henry J. Heimlich, 3850 Clifton Ave., Cincinnati, Ohio

Original application Dec. 4, 1967, Ser. No. 687,715, now Patent No. 3,537,457. Divided and this application Jan. 21, 1970, Ser. No. 12,876
Int. Cl. A61m *1/00*
U.S. Cl. 128—276 **6 Claims**



Sheath open only at its ends can be mounted with one end in sterile field. Other end connected to suction source. One end of flexible tubing in sheath communicates with suction source. Other end of tubing may be withdrawn from sheath at will to transmit suction to operative field, and returned to sheath during periods of non-use. Tubing may be resiliently formed for retraction, e.g., it may have a helical shape when retracted.

3,664,343
DISPOSABLE ARTICLES

Per Gunnar Assarsson, Montclair, N.J., assignor to Union Carbide Corporation, New York, N.Y.

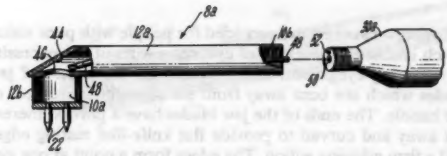
Filed Oct. 6, 1969, Ser. No. 864,193
Int. Cl. C08g *43/02*; A61f *13/16, 13/18*
U.S. Cl. 128—284 **14 Claims**

Improved disposable absorbent articles, such as diapers, catamenial devices and sanitary napkins, are provided which contain certain stabilized insoluble hydrophilic poly(ethylene oxide) polymers as an absorbing media. The polymers are stabilized with a stabilizing amount of poly(ethylene imine).

3,664,344
TYNED CRYOSURGICAL PROBE

Michael D. Bryne, Vernon, Conn., assignor to Brymill Corp., Vernon, Conn.

Filed Sept. 15, 1970, Ser. No. 72,317
Int. Cl. A61b *17/36*; A61f *7/12*; F25d *3/00*
U.S. Cl. 128—303.1 **2 Claims**



Freezing of large tissue masses to significant depths is achieved by utilizing a tyned cryosurgical probe having sharpened tynes that are embedded directly into the tissue to be frozen. Nitrogen is delivered in substantially liquid form directly to the exposed ends of the tynes or to metallic surfaces metallurgically bonded thereto. Examples of uses include starting a deep iceball with a tyned probe in accordance herewith and advancing the iceball deeper with other apparatus.

3,664,345
SURGICAL BUTTONS

Clyde Harwell Dabbs, 606 Main Ave., S.W., and Hugh G. Neil, P.O. Box 1950, both of Knoxville, Tenn.

Filed July 6, 1970, Ser. No. 52,449
Int. Cl. A61b *17/04*
U.S. Cl. 128—335 **10 Claims**

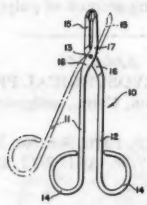
A surgical button for retaining a suture after passing through the skin on one side of an abdominal or other wound. The button comprises a non-metallic disc made of nylon or other suitable plastic material which has an axial orifice therethrough for passage of the suture and which axial passage or orifice is intersected by a radial orifice extending diametrically therethrough to receive a locking pin which engages the suture in a wedging action to hold it tightly in the disc. The button also comprises a pad of soft, spongy material, such as sponge rubber, secured to one face of the disc with a covering of cloth or fabric which lies against the skin

and prevents irritation or maceration. No tying of the suture is involved. It is held in place by the wedging action of the disc.

3,664,346
EYEBROW TWEEZERS

Dixie Dunn, Mobile, Ala.

Filed July 6, 1970, Ser. No. 52,181
Int. Cl. A61b *17/28*; B25b *7/00*
U.S. Cl. 128—355 1 Claim

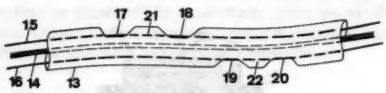


Eyebrow tweezers are provided for people with poor vision which enable the plucking of eyebrows without the necessity of removing eyeglasses. The tweezers include a pair of jaw blades which are bent away from the plane of movement of the handle. The ends of the jaw blades have a portion thereof cut away and curved to provide flat knife-like mating edges and a firm gripping action. The edges form a point at one end to facilitate manipulation of the tweezers beneath or between eyebrow hairs.

3,664,347
ELECTRIC HEART STIMULATION METHOD AND ELECTRODE

Dietrich Harmjanz, Diedenhofenerstrasse 17, 3 Hannover, Germany

Filed July 25, 1969, Ser. No. 844,876
Claims priority, application Germany, July 27, 1968, P 17 64 704.4; Apr. 16, 1969, P 19 19 246.2
Int. Cl. A61n *1/04*
U.S. Cl. 128—404 13 Claims

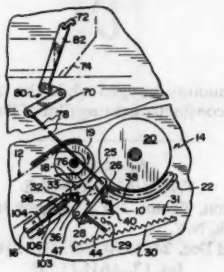


Apparatus and method for electrically stimulating a heart by means of a flexible filament that carries a conductor connected to an electrode which is exposed at the surface of the filament. According to the preferred embodiment, a portion of the filament extends beyond the electrode, thereby forming a flexible tail section that helps to hold the electrode at a desired position within the heart. According to the preferred method aspect of the disclosure, the above-described filament is introduced into a vein in the arm so that it is carried to the heart by the ordinary blood flow through the vein. The tail section of the filament is carried through the heart into a portion of the lungs in order to stabilize the position of the electrode within the heart.

3,664,348
STONE TRAP FOR A COMBINE

Arved Maiste, and Melvin F. Robertson, both of Brantford, Ontario, Canada, assignors to White Motor Corporation of Canada Limited, Brantford, Ontario, Canada

Filed Feb. 25, 1971, Ser. No. 118,762
Claims priority, application Canada, Mar. 13, 1970, 077,399
Int. Cl. A01f *12/16*
U.S. Cl. 130—27 JT 10 Claims

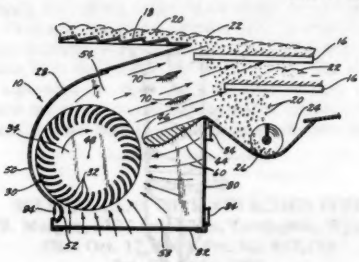


The stone trap is in the form of a trough having a front wall which extends below the delivery end of the feeder conveyor of a combine, a rear wall which extends below the entry edge portion of the concave of the combine, first and second side walls which are secured respectively to first and second frame members of the combine, and a trap door which extends across the bottom of the stone trap and in which is adapted to drop material caught in the stone trap into a portion of a grain pan of the combine which extends below the stone trap. To facilitate self-cleaning of the stone trap, the outlet width of the stone trap between the bottom edge of the front wall and the bottom edge of the rear wall is greater than the inlet width of the stone trap between the entry position of the concave and the top edge of the front wall.

3,664,349
COMBINE CLEANING BLOWER

Graeme R. Quick, Ames, Iowa, assignor to Iowa State University Research Foundation, Ames, Iowa

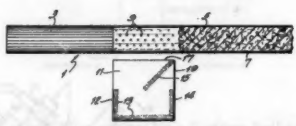
Filed Dec. 19, 1969, Ser. No. 886,471
Int. Cl. A01f *12/44*
U.S. Cl. 130—27 HF 8 Claims



A combine having grain cleaning sieves and a grain trough therebelow. A cross-flow fan is provided to blow air across the sieves and the fan includes an elongated hollow rotor having forwardly curved peripherally disposed spaced apart blades. A vortex regulator vane having an air foil cross-section is provided on one side between the inlet and the outlet opening and a housing wall is on the opposite side of the rotor. The leading edge of the air foil is closely adjacent the

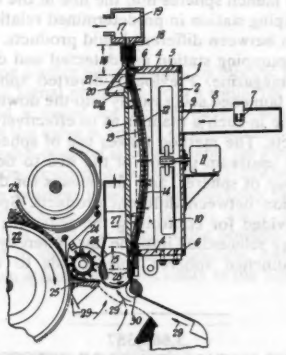
rotor in a radial plane through the longitudinal axis of the rotor. The housing wall extends partially around the rotor and is spaced progressively farther away from the inlet opening to the outlet opening. Vertically and horizontally disposed screens cover the inlet opening and are secured to the housing by springs to permit movement thereof and thereby maintaining them free of foreign material.

3,664,350
CIGARETTE
Byron T. Wall, 143-20 Franklin Ave., Flushing, N.Y.
Filed Dec. 12, 1969, Ser. No. 882,278
Int. Cl. A24d *01/02, 01/06*
U.S. Cl. 131—10 A **10 Claims**



A cigarette comprising a filter, a roll of tobacco, a wrapper surrounding the filter and tobacco which has a plurality of air ingress openings in an area adjacent to but ahead of the filter, and means overlying said openings to impede the ingress of air therethrough until the cigarette has been burned away to predetermined position and then automatically to uncover the openings for ingress of air. The atmospheric air blending with the smoke generated by burning the tobacco cools the smoke and precipitates condensibles which are caught and held by the filter.

3,664,351
CIGARETTE-MAKING MACHINERY
Frederick Russell, Southampton, England, assignor to Brown and Williamson Tobacco Corporation, Louisville, Ky.
Filed Feb. 19, 1970, Ser. No. 12,642
Claims priority, application Great Britain, Feb. 27, 1969, 10,509/69
Int. Cl. A24b *9/00*; A24c *5/14*
U.S. Cl. 131—110 **9 Claims**

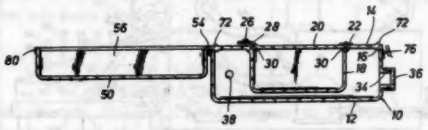


The invention is concerned with an apparatus and a method for the treatment of cut tobacco in a cigarette-making machine in which a stream of tobacco strands carried in a stream of air is subjected to microwave-radiation energy by passing it through a radiation chamber. Suitably, the wavelength of the microwave energy is in the range from 10 to 100 cms. and the stream of air carrying the tobacco is directed through the chamber at a substantial distance from the chamber walls where the energy level is low. The path of the tobacco strands through the chamber is defined by a pair of confronting end walls having straight inlet and outlet portions at their ends, and an arcuate portion therebetween that is convex toward a wave-guide that terminates in an outlet communicating with the interior of the chamber. The straight portions serve as microwave-retaining filters and the confronting walls are transparent to the passing of microwaves therethrough. A rotating fan is positioned to the passing of microwaves therethrough. A rotating fan is positioned in the chamber between the confronting walls and the energy inlet and serves to cool the adjacent arcuate wall. Tobacco leaving the chamber is formed into a filler stream and into a rod from which cigarettes may be cut.

3,664,352
TOBACCO SMOKE FILTER
Vello Norman, Chapel Hill, and Thomas B. Williams, Durham, both of N.C., assignors to Liggett & Myers Incorporated, New York, N.Y.
Filed July 27, 1970, Ser. No. 58,238
Int. Cl. A24b *15/02*; A24d *01/06*
U.S. Cl. 131—264 **16 Claims**

Hydrogen cyanide is removed from tobacco smoke by passing the smoke through a filter containing a water-insoluble, mixed-metal carbonate of an alkaline earth metal selected from the group consisting of magnesium, calcium, strontium and barium and a transition metal selected from the group consisting of cobalt, nickel, copper and zinc.

3,664,353
PORTABLE GROOMING KIT
Allen M. Childress, Jr., 1410 Speed, Monroe, La.
Filed Feb. 13, 1970, Ser. No. 11,038
Int. Cl. A45d *40/22*
U.S. Cl. 132—79 G **10 Claims**



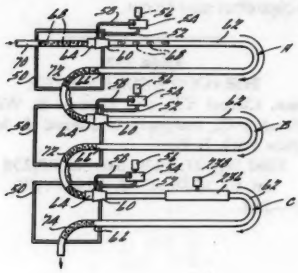
A portable kit suitable for use as an aid in personal grooming out of doors comprises a water-containing reservoir, water inlet and outlet means in the reservoir, a tub which fits against one side of the reservoir and is detachably hinged to the reservoir to permit use as a wash basin, latch means for holding the tub closed against the reservoir, and a handle on the reservoir to permit convenient carrying.

3,664,354

APPARATUS FOR PROCESSING WORKPIECES

Louis J. Minbiole, Jr., Detroit; Chester G. Clark, Grosse Pointe Woods, and John W. Neumann, Birmingham, all of Mich., assignors to The Udylite Corporation

Filed Nov. 12, 1968, Ser. No. 774,923
Int. Cl. B08b *3/08, 3/10;* B05c *3/08;* B67c *1/00*
U.S. Cl. 134—61 22 Claims



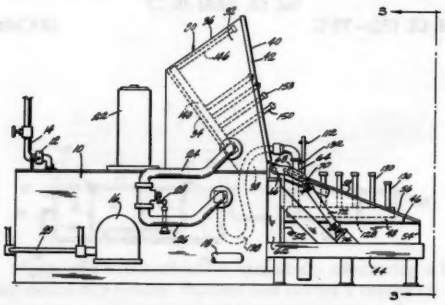
Apparatus for simultaneously treating and conveying workpieces by which a rapidly moving confined stream of a treating fluid is formed into which workpieces are introduced for entrainment and conveyance thereby and are subsequently extracted from the stream and thereafter successively introduced, if desired, into separate succeeding streams in an ordered sequence, thereby performing a multiple-stage treatment of the workpieces.

3,664,355

CONTAINER WASHING APPARATUS

Robert J. Adams, 15601 Charles R Avenue, East Detroit, Mich.

Filed July 20, 1970, Ser. No. 56,538
Int. Cl. B08b *3/02, 9/08*
U.S. Cl. 134—143 5 Claims



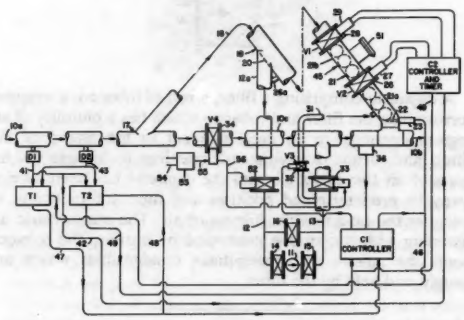
A device for washing industrial gondolas consisting of two receptacles each open at one end and forming half sections of a gondola washing chamber. One of the sections is adapted to be pivoted from an open position to a position closing with the other section to form the washing chamber. The movable section has a platform on which a gondola is adapted to be clamped and arranged to support the gondola in a generally inverted position when the sections are closed. The two sections have sets of nozzles thereon arranged for directing high pressure jets of washing liquid against the inner and outer sides of all the gondola walls.

3,664,356

PUMPING STATION SPHERE HANDLING METHOD AND SYSTEM

Marvin H. Grove, and Lyle R. Van Arsdale, both of Houston, Tex., assignors to M & J Valve Company, Houston, Tex.

Filed July 30, 1970, Ser. No. 59,573
Int. Cl. B08b *9/04*
U.S. Cl. 137—1 12 Claims



A method and system applicable to pipeline systems for handling spheres at pumping stations. Particularly the invention serves to launch spheres into the line at the downstream side of a pumping station in predetermined relation to an interface region between different liquid products. Spheres arriving at the pumping station are detected and diverted and stored in a magazine. Previously diverted spheres in the magazine are launched successively into the downstream portion of the line in such a manner as to effectively divide different products. The method makes use of sphere detecting means in the upstream portion of the line to detect the arrival of a group of spheres, and also means for detecting the interface region between different products. Special timing means is provided for controlling the sequence with which the spheres are relaunched into the line, whereby the spacing between relaunched spheres corresponds to a particular volume.

3,664,357

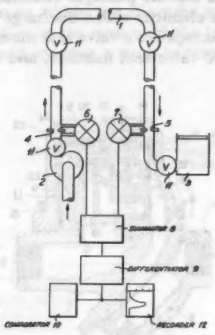
METHOD AND INSTALLATION FOR DETECTING FLUID LEAKAGE FROM A PIPELINE

Manfred Kreiss, Mannheim-Kirchwald, Germany, assignor to Erdol-Raffinnerie Mannheim GmbH, Mannheim, Germany

Filed Dec. 23, 1970, Ser. No. 100,967
Int. Cl. G05d *7/03*
U.S. Cl. 137—2 10 Claims

A pipeline leakage detection method and installation including measuring fluid flow rates in the pipeline at spaced points and obtaining summated and differentiated electrical current values corresponding to differences in the measured

rates. Increases in current rates corresponding to a pipeline break are instantaneously relayed to means for sounding an



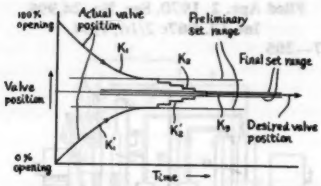
alarm and to means for preventing further leakage flow of liquid product in the pipeline.

3,664,358

METHOD OF AUTOMATIC VALVE CONTROL

Takeshi Kosugi, Nara, and Toshio Kunimitsu, Hirakata, both of Japan, assignors to Nakakita Seisakusho Company Limited, Osaka, Japan

Filed Sept. 28, 1970, Ser. No. 75,865
Claims priority, application Japan, Oct. 2, 1969, 44/78729
Int. Cl. F16k *31/02*; G05d *16/00*
U.S. Cl. 137—14 2 Claims



Controlling a valve automatically by electric feedback with a differential signal produced from a signal for desired valve position and a signal for actual valve position in such a manner that the valve is opened or closed continuously while the actual valve position is considerably far from the desired valve position, is opened or closed intermittently while the actual valve position is not so considerably far but insufficiently approximate to the desired valve position, and remains as it is when the actual valve position is sufficiently approximate to the desired valve position, and, in addition, that the valve is tightened sufficiently in the full closing position.

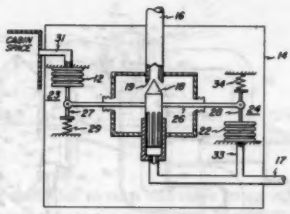
3,664,359

AIRCRAFT CLOSED CIRCUIT BREATHING SYSTEM

Angelo Dounoucos, Schenectady, N.Y., and John W. Harrison, Manchester, Mass., assignors to General Electric Company

Original application July 1, 1968, Ser. No. 741,527, now Patent No. 3,552,392. Divided and this application Feb. 27, 1970, Ser. No. 18,398
Int. Cl. A62b *9/02*
U.S. Cl. 137—81 1 Claim

An improvement is presented in an aircraft oxygen closed circuit breathing system wherein in place of the previously proposed flexible breathing bag rendering the system volume



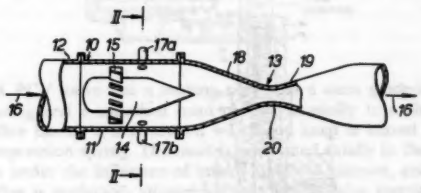
a variable, a compressor is employed converting the system to one having a variable pressure and a constant volume.

3,664,360

FLUID FLOW CONTROL DEVICES

Joseph Kenneth Royle, Bakewell; John Grant, Risley, and Jack Alexander Golder, Lower Walton, all of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed June 15, 1970, Ser. No. 45,963
Claims priority, application Great Britain, June 25, 1969, 32,202/69
Int. Cl. F15c *1/04*
U.S. Cl. 137—81.5 6 Claims



A vortex amplifier with a chmber having co-axial inlet and outlet ducts. In the chamber is disposed a flow shaper body which confines fluid flow through the chamber to the outer part of the chamber. Flow directing means such as vanes are also disposed in the chamber so as to impart a rotary component of flow to fuild passing through the chamber. Control ports direct a control flow of fluid tangentially into the chamber to interact with fluid flow to which a rotary component has been applied.

3,664,361

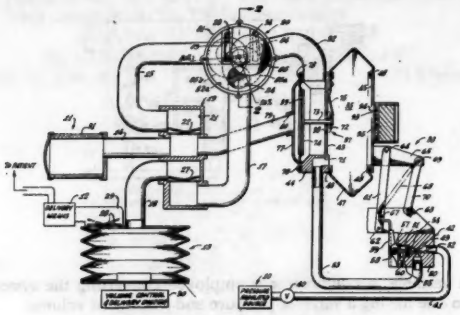
RESPIRATION SYSTEM

Harold Bartels, Reseda, Calif., assignor to Puritan-Bennett Corporation, Kansas City, Mo.

Filed Aug. 24, 1970, Ser. No. 66,246
Int. Cl. G05d *11/02*
U.S. Cl. 137—98 14 Claims

A respiration system for mixing oxygen from a pressure-regulated source with room air at ambient pressure in a proportion which is infinitely variable. Air and oxygen are drawn through a proportioning valve having inlets with effective flow areas of the same relationship as the proportion of air and oxygen desired. The pressure at the oxygen inlet is varied in accordance with air pressure variations by a pressure-operated balancing valve for admitting oxygen from a reser-

voir in response to sensed variations in the air intake pressure. Selective adjustment of the air/oxygen proportion of the



mixture is accomplished with a manually movable valve member for varying the inlet area relationship.

3,664,362

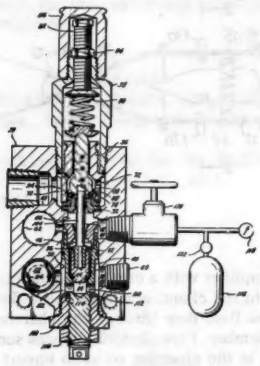
PILOT VALVE

Irvin B. Weise, Bellaire, Tex., assignor to Anderson, Greenwood & Co., Houston, Tex.

Original application Feb. 6, 1969, Ser. No. 796,961, now Patent No. 3,568,706. Divided and this application Jan. 22, 1971, Ser. No. 108,906

Int. Cl. F16k *17/10*

U.S. Cl. 137—102 9 Claims



A pilot valve to be utilized in a pressure relieving system. The pilot valve controls the pressure setting for relief and blowdown through the main valve and assures that there is no reverse flow through the fluid pressure supply line, thereby allowing field testing of the main valve to determine if it is functioning properly while the pilot valve is installed in the system controlling the operation of the main valve.

3,664,363

STEAM TRAP

Sentaro Miyawaki, 26-32, 3-chome, Nishi Senriyama, Suita Osaka-fu, Japan

Continuation-in-part of application Ser. No. 755,942, Aug. 28, 1968, now abandoned. This application Sept. 21, 1970, Ser. No. 74,040

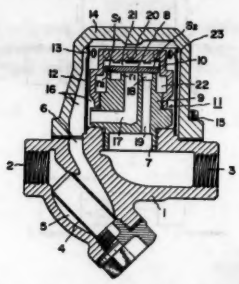
Claims priority, application Japan, Sept. 5, 1967, 42/56873

Int. Cl. F16t *1/00*

U.S. Cl. 137—183 10 Claims

A disk type steam trap having a trap unit and a jacket communicating with both an inlet opening of the steam trap and a valve port passage of the trap unit having an intermediate pressure chamber, a condensate reservoir of a suitable internal volume formed below the intermediate pressure chamber, and one or more bleeder passages communicating the intermediate pressure chamber with a discharge passage.

The trap unit comprises a valve seat member, a disk placed on the top of the valve seat member, and a cap forming the



intermediate pressure chamber at the back of the disk. The valve seat member has an inner annular seat and an outer annular seat. The valve port passage issues from the inside of the inner annular seat and communicates with the inlet opening of the steam trap through the jacket. An annular groove is formed between the inner and outer annular seats, and the discharge passage issues from the annular groove and communicates with an outlet opening of the steam trap.

3,664,364

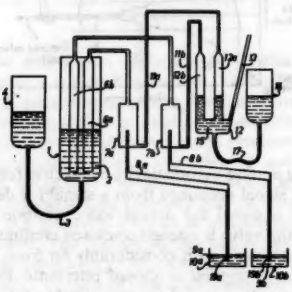
TRANSFER OF A PLURALITY OF LIQUIDS

Jean-Marie Faure, 28, Boulevard Aristide Briand, 91-Savigny S/Ogre, France

Filed Apr. 2, 1970, Ser. No. 24,995

Int. Cl. B67c *2/16, 1/04*

U.S. Cl. 137—205 3 Claims



A chamber is provided with a plurality of conduits having non-horizontal portions into which a fluid can be continuously charged to control movement of one or more other fluids as well as a rinsing fluid which may optionally be employed.

3,664,365

METHOD OF AN APPARATUS FOR THE AUTOMATIC SUPERVISION OF LIQUID LIMITS IN CLOSED TANKS

Claude Marie Ernest Ralet, and Daniel Albert Clement Ralet, both of 661 Boulevard Poincare, Brussels, Belgium

Filed June 25, 1970, Ser. No. 49,719

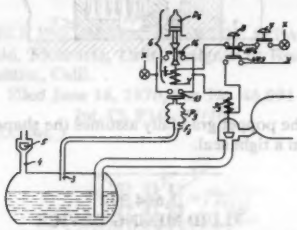
Claims priority, application Belgium, June 26, 1969, 735,169

Int. Cl. G01f *23/14*

U.S. Cl. 137—206 15 Claims

A level detector for a tank for liquid comprises a dip tube having an open lower end within the tank. At its upper end

the tube carries a pressure detector and a restricted orifice communicates the tube with an environment external to the tank. A higher gas pressure is produced in the tank than in said environment e.g. by the introduction of liquid into the tank and the pressure within the dip tube remains substantially the same as that in the tank until the lower end of the dip tube is immersed, causing a drop in pressure within the



dip tube. This drop in pressure is used to control the introduction or removal of liquid from the tank to limit the level to a desired value. In a variant two dip tubes are used for each level each having its own restricted orifice communicating with said environment and one having its lower end slightly below the other, and the pressure detection means is responsive to the differential pressure between the dip tubes.

3,664,366

FLUID PRESSURE REGULATING DEVICE

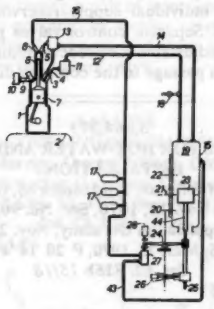
Oscar Ferrer Munguet, Balmes 188, 6°1a, Barcelona 6, Spain

Filed Jan. 24, 1969, Ser. No. 793,855

Claims priority, application Spain, Jan. 25, 1968, 349,747

Int. Cl. B63g *8/24*

U.S. Cl. 137—209 **9 Claims**



A regulating device for adjusting the pressure and/or volume of a body of gas or liquid relative to an ambient or exterior gas or liquid. The regulating device has particular application in marine situations and can be installed in a submersible vessel, e.g. a diving device or a submarine, to control the condition of flotation of the vessel on or under the sea or other large water mass. Various embodiments of the regulating device and their uses are given.

3,664,367

TRAVELLING SPRINKLER SHUT OFF

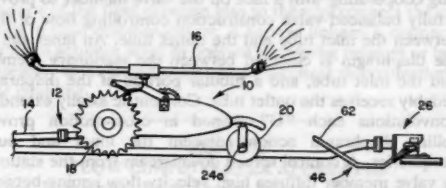
George J. Schaefer, Jr., Beatrice, Nebr., assignor to F. D. Kees Manufacturing Co., Beatrice, Nebr.

Filed Oct. 14, 1970, Ser. No. 80,588

Int. Cl. B05b *9/02*; E01h *3/02*

U.S. Cl. 137—344 **4 Claims**

A sprinkler shut off, more particularly an automatically operated sprinkler shut off valve mechanism for a travelling type of sprinkler. The mechanism includes a lever, attached to a valve shut off handle, engageable by an arm carried by



the travelling sprinkler to turn the valve to an off position as the sprinkler moves into operative engagement therewith.

3,664,368

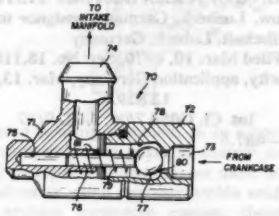
PCV VALVE

Frank B. Sweeney, Rochester, N.Y., assignor to Emcon Technology, Inc., Rochester, N.Y.

Continuation-in-part of application Ser. No. 799,798, Feb. 17, 1969, now abandoned. This application May 10, 1971, Ser. No. 141,788

Int. Cl. F16k *17/04*

U.S. Cl. 137—480 **4 Claims**



A PCV valve has a moving part with a stem guided in a bearing and a spherical head moving coaxially in a shaped orifice having a seat toward which the head is biased by a compression spring. The head is positioned axially in the orifice under the influence of intake manifold vacuum, and the orifice is preferably shaped for the desired valve opening at different engine operating conditions.

3,664,369

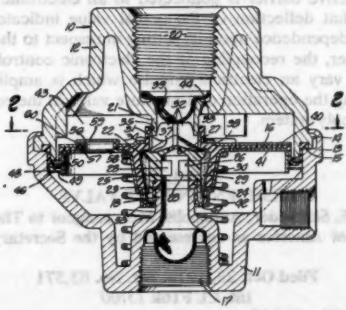
PRESSURE REDUCING REGULATOR

Dwight N. Johnson, Anaheim, Calif., assignor to The Singer Company, New York, N.Y.

Filed Dec. 9, 1970, Ser. No. 96,454

Int. Cl. F16k *17/34*

U.S. Cl. 137—484.4 **13 Claims**



A pressure regulator of the "straight-through" type employs a stationary valve member clamped between axially

aligned tubes carried on inlet and outlet body parts. A flexible diaphragm clamped between the body parts has a seat ring cooperating with a face on the valve member to provide a fully balanced valve construction controlling flow of fluid between the inlet tube and the outlet tube. An inner rim on the diaphragm is clamped between the stationary member and the inlet tube, and a tubular portion of the diaphragm slidably receives the outlet tube. Concentric axially extending convolutions each "U" shaped in cross-section provide rolling diaphragm action adjacent the inner and outer peripheries. A control screen downstream from the stationary valve member diffuses high velocity flow issuing between the valve face and seat ring, and passage means establish communication between the fluid downstream from the control screen and a chamber defined between the diaphragm and the inlet body part. A spring within the body acts to move the diaphragm in a direction opposed by pressure in the chamber. Stiffener plates confine a central portion of the diaphragm between them and are secured together in a manner to eliminate any leakage path. Tubular projections on one plate extend through aligned apertures in the diaphragm and in other plate, each projection having an enlarged integral end wall forming a clamping lip.

3,664,370

TRIGGER DEVICE FOR OPERATING A CONTROL VALVE OF A RESPIRATORY SYSTEM

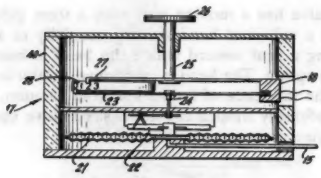
Detlef Warnow, Luebeck, Germany, assignor to Dragerwerk Aktiengesellschaft, Lubeck, Germany

Filed Mar. 10, 1970, Ser. No. 18,118

Claims priority, application Germany, Mar. 13, 1969, P 18 12 829.1

Int. Cl. G05d *7/00*; G01l *9/10*

U.S. Cl. 137—487.5 **5 Claims**



A trigger device for controlling the operation of a control valve for an artificial respiration system includes a pressure sensitive control element which is admitted with the pressure of a line carrying the respiration gas and it operates and causes a deflection of an actual value indicator which moves in its deflection range past as adjustable inductive barrier. The inductive barrier is connected to an electronic control unit so that deflection of the actual value indicator interrupts, in dependence upon its setting in respect to the inductive barrier, the recoupling of the electronic control unit in order to vary an electrical impulse which is amplified for controlling the operation of a pressure valve in the respiratory gas supply system.

3,664,371

RESILIENT POPPET VALVE

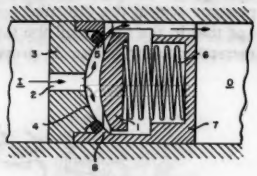
William E. Schneider, Annapolis, Md., assignor to The United States of America as represented by the Secretary of the Navy

Filed Oct. 23, 1970, Ser. No. 83,571

Int. Cl. F16k *15/00*

U.S. Cl. 137—516.29 **3 Claims**

A lightweight poppet valve having a resilient poppet in which the radius of the spherical contact surface is slightly larger than the radius of the spherical contact surface of the metal valve seat such that as the pressure behind the poppet



increases the poppet gradually assumes the shape of the valve seat to form a tight seal.

3,664,372

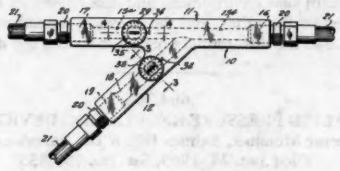
FLUID MIXING DEVICE

Harold A. Marshall, 65 Carnegie Ave., East Orange, N.J.

Filed Apr. 30, 1970, Ser. No. 33,316

Int. Cl. F16k *19/00*, *5/04*

U.S. Cl. 137—552 **1 Claim**



A mixing manifold is provided with a plurality of inlet passages each having an individual inlet opening, with all of the inlet passages communicating with a common discharge passage and opening. The feed passages are adapted for communication with individual supply reservoirs by means of suitable conduits. Separate control valves provided in each inlet passage are adjustable for predetermining the amount of flow through each passage to the common discharge passage.

3,664,373

APPARATUS FOR HOT-WATER AND HEATING INSTALLATIONS

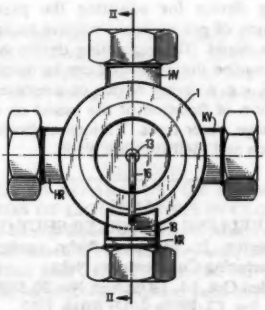
Karl Schichl, Ottweilerstr. 2, 8 Munich 83, Germany

Filed Nov. 18, 1970, Ser. No. 90,505

Claims priority, application Germany, Nov. 20, 1969, P 19 58 277.5; Mar. 25, 1970, P 20 14 415.4

Int. Cl. F15b *15/18*

U.S. Cl. 137—565 **18 Claims**



A circulating pump with a mixer valve combined to form an apparatus especially for hot-water and heating installa-

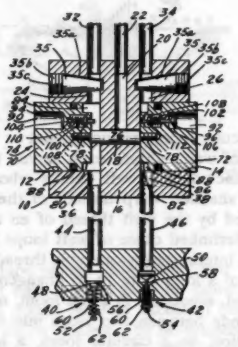
tions, wherein the pump drive is utilized also for the automatic control of the mixer valve. The mixer unit is locked in specific positions by a remote-control unlatching device either by a likewise remote-controlled synchronizing device in engagement with the pump impeller making this possible over one rotation, or this is effected by a hydromechanical coupling whereby liquid raised through the pump is put into a rotary motion.

3,664,374

BISTABLE PNEUMATIC FLIPFLOP APPARATUS

John D. Reid, Monrovia, Calif., assignor to Hamilton Company, Whittier, Calif.

Filed June 16, 1970, Ser. No. 46,691
Int. Cl. F16k *11/10*
U.S. Cl. 137—596.2 9 Claims



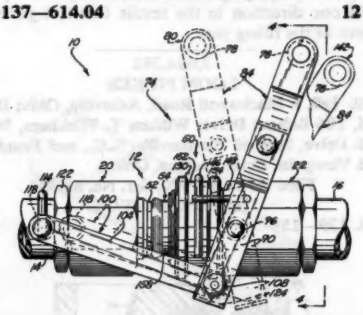
A pressure switching and venting pneumatic control valve for use wherever reciprocating motion is desired. The pressure control and venting apparatus controls pressure actuating fluid and venting for a mechanism having a reciprocating part to be moved in opposite directions and to be stopped. There is a shuttle having a pair of interconnected, oppositely arranged pistons operated by venting or relief of fluid pressure in the pneumatic system, and there is a simple remote control means for the control valve.

3,664,375

COUPLING MECHANISM

Ralph Thomas Marette, Orange Village, Ohio, assignor to The Hansen Manufacturing Company, Cleveland, Ohio

Filed Aug. 10, 1970, Ser. No. 62,566
Int. Cl. F16l *37/28*
U.S. Cl. 137—614.04 12 Claims



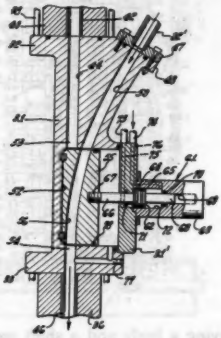
An improved coupling mechanism includes an actuator assembly which is manually operable to connect and disconnect a coupling having valves which are biased closed by fluid pressure. The actuator assembly includes a lever which is pivotally mounted on one coupling member. A linkage connected to the actuator lever is engageable with the other coupling member. Once the linkage has been engaged with the other coupling member, the lever is pivoted to actuate the linkage and move the coupling members toward each other to a connected condition. Simultaneously therewith, the valves are operated to the open condition against the influence of the fluid pressure bias to thereby connect the conduits in fluid communication. A second linkage is connected with the actuator lever to operate a coupling retainer or latch assembly to a release condition to facilitate disconnection of the coupling.

3,664,376

FLOW LINE DIVERTER APPARATUS

Bruce J. Watkins, Palos Verdes Estates, Calif., assignor to Regan Forge and Engineering Company, San Pedro, Calif.

Filed Jan. 26, 1970, Ser. No. 5,662
Int. Cl. F16k *11/06*
U.S. Cl. 137—625.68 5 Claims



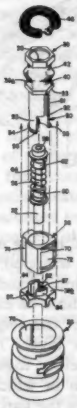
A chambered housing mounted, or in association with, a subsea wellhead with fluid passages therein communicating with the well casing and at least two or more associated fluid conduits, a diverter valve member within said chamber including an arcuate transverse passage therethrough and means for moving such diverter valve member in the chamber for selectively diverting communication with said well casing between two of such fluid conduits.

3,664,377

CONTROL FOR A RECIPROCATING FLUID MOTOR

Charles Passaggio, Cheshire, Conn., assignor to Scovill Manufacturing Company, Waterbury, Conn.

Filed Sept. 21, 1970, Ser. No. 73,987
Int. Cl. F01l *31/08*; F16k *31/56*
U.S. Cl. 137—625.69 2 Claims



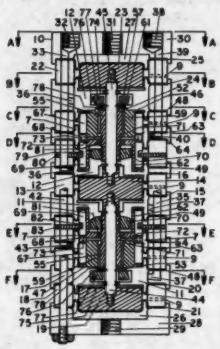
A control for a reciprocating fluid motor in which a sliding valve is moved back and forth by a two-piece drive sleeve of resilient material. The drive sleeve comprises a slotted tubu-

lar member adapted to be radially compressed to receive the second piece, a nut having a part fitting into the slot to avoid accidental disassembly. The nut and an enlarged portion of the tubular piece work on opposite sides of the slide valve.

3,664,378
VALVE

William F. Brecht, Jr., 141 East Atlantic Ave., Audubon, N.J.

Filed Mar. 9, 1970, Ser. No. 17,821
Int. Cl. F16k *31/44*
U.S. Cl. 137—635 5 Claims

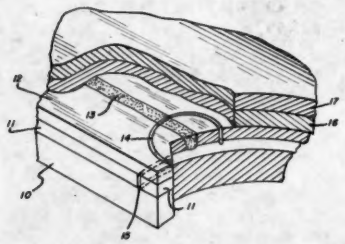


A valve having a body and a shaft moving longitudinally within the body, wherein the shaft selectively opens and closes concentric annular orifices which function either in a balanced condition or unbalanced condition.

3,664,379
MULTIPLE-LAYER VESSEL WITH CRACK ARRESTING WELDED JOINT

John Stanton McCabe, Naperville, Ill., assignor to Chicago Bridge & Iron Company, Oak Brook, Ill.

Int. Cl. F16l *9/02*
U.S. Cl. 138—143 7 Claims



A multiple-layer vessel having an inner shell over which a filler or dummy layer is wrapped. The edges of the filler or dummy layer are left unjoined and with a gap between them. The gap can be longitudinal or circumferential with respect to the longitudinal axis of the vessel. A load-bearing layer is placed around the filler layer. The adjacent edges of the load-bearing layer are welded together and to the filter layer. The area of intersection in which the welded joint of the load-bearing layer crosses the gap in the filler layer is cut-out at least to the full thickness of the load-bearing layer to provide a mechanical discontinuity or crack arrester. The cut-out area extends at least partially into the filler layer.

3,664,380
LOOM WITH TRAVELING SHED

Karl Haberhauer, and Hertha Haberhauer, both of Grunstadt, Germany, assignors to Weinheimer Gummiwerke Gesellschaft mit beschrankter Haftung, Mannheim, Germany

Continuation-in-part of application Ser. No. 849,564, July 23, 1969. This application May 8, 1970, Ser. No. 35,818
Claims priority, application Germany, July 5, 1969, P 19 34 298.4
Int. Cl. D03d *47/06, 47/26*
U.S. Cl. 139—12 15 Claims

A flat or circular loom produces a flat or tubular fabric in a multiplicity of web sections each served by an individual weaving unit including a weft needle whose thread, after traversing the shedded warp threads of the associated section, is engaged by the weft thread of an adjoining needle whereby an interlinked chain of weft loops is formed to act as a filling. An intermittently operable thread clamp prevents a contraction of a loop prior to its engagement by the next weft needle and, especially in a flat loom, may also be used to draw the node between two loops into the fabric of the preceding section. In a circular loom, a loop inverter associated and synchronized with each weft needle causes the cross-links between the nodes of adjacent tiers to come to lie on the inside of the tubular fabric.

3,664,381
PRESS FREE TEXTILE FABRIC

William F. Ibach; Franklin S. Looney, Jr., both of Wilmington, Del., and David C. Reitz, Chadds Ford, Pa., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

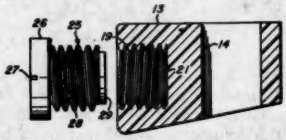
Continuation-in-part of application Ser. No. 690,099, Dec. 13, 1967, now abandoned. This application May 22, 1970, Ser. No. 39,912
Int. Cl. D03d *15/00;* D06m *13/34*
U.S. Cl. 139—420 9 Claims

Press-free polyester-cotton fabrics of improved durability are obtained by applying a textile resin only to the yarns that travel in one direction in the textile fabric, e.g., either the warp yarn or the filling yarn.

3,664,382
LOOM PICKER

Mayo B. Tell, 6 Blackwood Road, Asheville, Ohio; Donald D. Kidd, 106 Balsam Drive; William T. Wickham, 903 Brunswick Drive, both of Waynesville, N.C., and Frank Brown, 5556 Viewpoint Drive, Dayton, Ohio

Filed Nov. 13, 1970, Ser. No. 89,331
Int. Cl. D03d *49/36*
U.S. Cl. 139—159 5 Claims



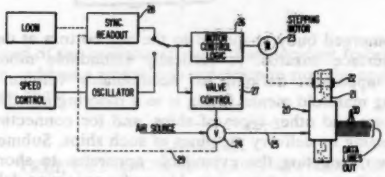
A loom picker which has a body of resilient elastomeric material and a shuttle-contacting insert of a wear-resistant

material which is harder than the body. The insert has a threaded configuration and is mounted in a cavity which also has a threaded configuration, the cavity extending partially through the body but terminating short of the picket stick.

3,664,383
PNEUMATIC CONTROL MECHANISM FOR LOOMS AND THE LIKE

Jerry M. Minchey, 202 Sycamore Drive, and Willard A. Ramsey, 108 Paxton Street, both of Mauldin, S.C.

Filed June 11, 1970, Ser. No. 45,385
Int. Cl. D03d *49/00*; D03c *13/00*
U.S. Cl. 139—317 **4 Claims**

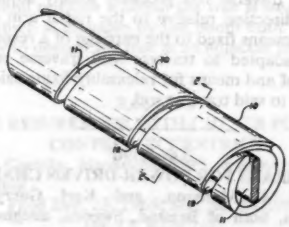


A pneumatic tape reader utilizes standard 1 inch wide 8 column punched data tape to activate pattern control elements of a loom dobby head or Jacquard head to produce variations in the weave pattern. The advancement of the tape through the reader is synchronized with the pick cycle of the loom and an air supply valve for the reader is similarly synchronized. A simplified pneumatic actuator for each loom pattern control element is operated by a small pneumatic output tube on the reader, thus eliminating relatively expensive conventional air cylinder and piston units. The reader possesses general utility in the reading of pneumatic data to any pneumatic logic system of fluidic system of gates, flip-flops, amplifiers or the like.

3,664,384
WIRE FORMING MACHINE

Herbert W. Scott, Burnaby, British Columbia, Canada, assignor to Gilbey Equipment Ltd., West Vancouver, Province of British Columbia, Canada

Filed Sept. 11, 1969, Ser. No. 858,569
Int. Cl. B21f *21/00*, *45/00*
U.S. Cl. 140—92.94 **2 Claims**

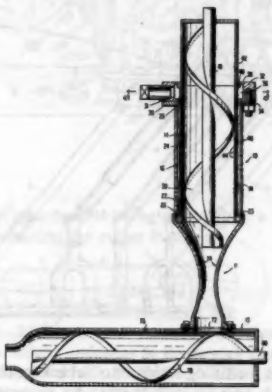


A wire forming die for link fencing comprising a cylinder with a helical slot cut through it of which the inner edges of the slot are relieved to prevent damage to wire formed by the die.

3,664,385
METHOD AND APPARATUS FOR FEEDING AND COMPACTING FINELY DIVIDED PARTICULATE MATERIAL

Clarence F. Carter, Danville, Ill., assignor to Carter Engineering Company, Danville, Ill.

Continuation-in-part of application Ser. No. 718,123, Apr. 2, 1968, now Patent No. 3,580,419. This application Feb. 12, 1971, Ser. No. 114,897
Int. Cl. B65b *1/04*, *3/04*
U.S. Cl. 141—12 **22 Claims**



A method of feeding and compacting finely divided particulate material which utilizes a first rotating screw feeder for advancing the material along a first sleeve passage provided by a stationary foraminous sleeve mounted closely about the first screw feeder, and a second rotating screw feeder for advancing the material along a second sleeve passage to a container filling station. The method includes the steps of advancing the particulate material axially along the sleeve with the interstitial air between the particles in the sleeve at an internal sleeve pressure. Suction pressure relatively lower than the internal sleeve pressure is applied to the exterior of the sleeve to withdraw air from between the particles of the material to effect compaction of the material. At predetermined times gas pressure relatively higher than the internal sleeve pressure is applied to the exterior of the sleeve to back-flush material from openings in the sleeve to prevent clogging thereof. Cool, dried air may be utilized for back-flushing to cool the material without causing condensation to form within the densifier. The densified material may then be mechanically advanced along the second sleeve passage to the container filling station.

An apparatus for feeding and compacting finely divided particulate material, which includes a housing having fixedly mounted therein a tubular sleeve. The sleeve and housing define at least one closed hollow chamber extending about the sleeve with a plurality of perforations in the sleeve placing the interior thereof in fluid communication with the interior of the chamber. An axially extending screw feeder concentrically and rotatably mounted in the sleeve is adapted to advance material axially along the sleeve, with the interstitial air present between the particles of material in the sleeve at an internal sleeve pressure. Suction means in fluid communication with the chamber applies suction pressure relatively lower than the internal sleeve pressure to withdraw air from between the particles of material to effect compaction thereof. Gas pressure means in fluid comm unication with the chamber provides gas, preferably cool, dried gas, at a relatively higher pressure than the internal sleeve pressure at predetermined times to back-flush particulate material from the perforations, to prevent clogging thereof. The densifier material is discharged into a second screw feeder which

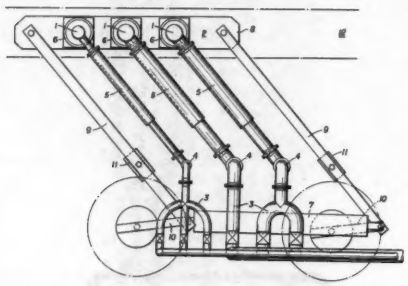
delivers the material to a container filling station while maintaining back pressure on the material in the densifier and while maintaining material compaction.

3,664,386

APPARATUS FOR FILLING FLUIDS INTO VEHICLE CONTAINERS

Hermann Wenzel, Vienna, Austria, assignor to Waagner-Biro AG, Vienna, Austria

Filed Feb. 24, 1970, Ser. No. 13,375
Claims priority, application Austria, Feb. 24, 1969, 1848
Int. Cl. B65b *1/04, 3/04*
U.S. Cl. 141—100 16 Claims



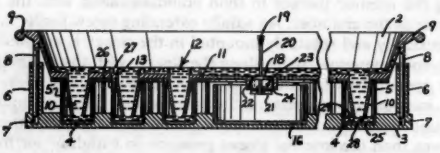
An apparatus for filling fluids into vehicle containers such as tanks of tank cars or tank trucks. An elongated pipe assembly has an inner fluid-receiving end and an outer fluid-discharging end for discharging fluid into the vehicle container. This assembly includes a support which supports the assembly for swinging movement at its inner end about a vertical axis. The assembly also includes structure for enabling the assembly to change the distance of the outer end of the assembly from its inner end. A movement-limiting arrangement is operatively connected with the outer end of the pipe assembly for limiting the latter to movement along a substantially straight, horizontal path while the assembly swings about the vertical axis at its inner end, so that in this way the outer end of the pipe assembly is constrained to move in a direction parallel to the travel of a vehicle. The pipe assembly automatically changes the distance of its outer end from its inner end as required to maintain the outer end of the assembly along this path.

3,664,387

LIQUID DISPENSING DEVICE

John D. Cates, Jr., 3653 Bennett Drive, Montgomery, Ala.

Filed Apr. 6, 1970, Ser. No. 25,830
Int. Cl. B65b *3/06*
U.S. Cl. 141—238 4 Claims



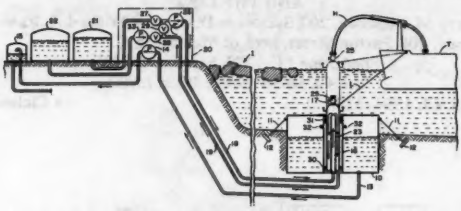
A liquid dispensing apparatus for the simultaneous filling of a plurality of containers. A funnel housing placed over the containers has depending funnel members, each being positioned over a separate container for filling same with a premeasured quantity of liquid.

3,664,388

SUBMERSIBLE TANKER MOORING SYSTEM

Ernest G. Frankel, Cambridge, Mass., assignor to Seatrain Lines, Inc., New York, N.Y.

Filed July 9, 1970, Ser. No. 53,443
Int. Cl. B63b *27/00*
U.S. Cl. 141—284 15 Claims



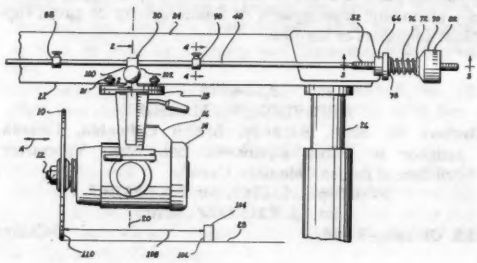
A submerged buoy anchored to the sea bottom at depths below surface hazards. A vertically extendable mooring-transfer apparatus defining an accumulator volume, and providing manifold means fitting it as a mooring attachment for tankers and other types of ships, and for connecting to the receiving or delivery pipelines of such ships. Submerged pipelines connecting the extendable apparatus to shore or other supply or receiving points. Means for receiving-delivering oil through said pipes and apparatus and between said ships and shore or other points, and for pressuring said accumulator volume to extend said apparatus to operating position above, at, or near the surface.

3,664,389

LATERAL ADJUSTMENT MEANS FOR RADIAL ARM SAWS

Exil E. Bower, 1430 West 4th Place, Mesa, Ariz.

Filed June 1, 1970, Ser. No. 41,871
Int. Cl. B27b *5/28*
U.S. Cl. 143—6 A 7 Claims



A lateral adjustment means for radial arm saws comprising an elongated traverse rod precisely axially adjustable in a longitudinal direction relative to the radial arm of a radial arm saw and means fixed to the carriage of a respective radial arm saw adapted to traverse said traverse rod longitudinally thereof and means for releasably fixing said last mentioned means to said traverse rod.

3,664,390

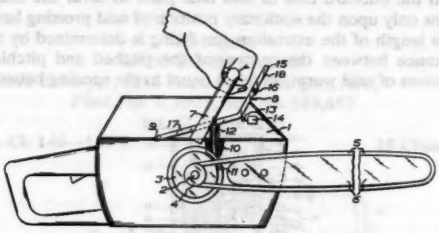
SAFETY MEANS FOR POWER-DRIVEN CHAIN SAWS

Leif Erling M. Mattsson, and Karl Garry Kenneth Fredriksson, both of Brastad, Sweden, assignors to Jonsereds Fabrikers Aktiebolag, Jonsered, Sweden

Filed Oct. 20, 1970, Ser. No. 82,342
Claims priority, application Sweden, Oct. 29, 1969, 14771
Int. Cl. B27b *17/02*; B27g *19/00*
U.S. Cl. 143—32 R 6 Claims

In a chain saw driven by an internal combustion engine a safety means comprising switch and brake means adapted to

break the ignition current of the engine and stop the saw chain, and actuating means which is situated in a position in front of the handle of the saw and arranged to be operated by



the hand of the operator in case of an accident to bring said switch and brake means into operation to stop the engine and the saw chain.

3,664,391

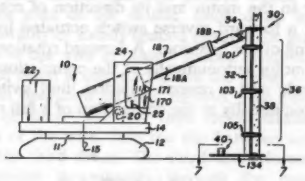
TREE CUTTING AND PILING APPARATUS

Horace D. Coffey, P.O. Box 211, Quesnel, British Columbia, Canada

Filed Mar. 16, 1970, Ser. No. 19,696

Int. Cl. B27b *17/02, 11/12;* **A01g** *23/08*

U.S. Cl. 143—32 N **6 Claims**



Apparatus having a mast the upper end of which is secured to a boom and the lower end of which supports a saw. Gripping devices on the mast grasp and hold a tree as the tree is engaged by the saw. The saw includes a support plate which is entered into the kerf as the cut progresses and, at the completion of the cut, the support plate can be used to form a seat for the butt end of the tree. The gripping devices are independently operable to obtain a grip on a second tree while a first tree is still clamped to the mast. The connection between the boom and mast is such that the mast is rotatable to a horizontal position wherein the tree is suspended below the mast which is movable by the boom both vertically and horizontally to deposit the tree at an adjacent unloading site.

3,664,392

LANE RESURFACER WITH CUTTER POSITION CONTROL ECCENTRICS

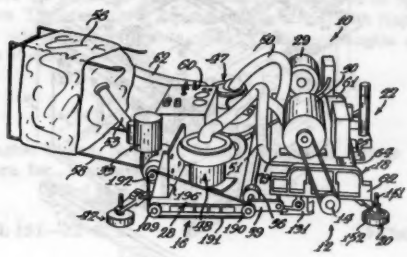
Anthony J. Gretsky, Muskegon, Mich., assignor to Brunswick Corporation

Filed Dec. 23, 1969, Ser. No. 887,598

Int. Cl. B27c *1/02*

U.S. Cl. 144—117 C **23 Claims**

A lane resurfacer for a bowling lane having a carriage with a milling cutter mounted for rotation transversely thereof, there being provide a front skid for supporting the carriage and two laterally spaced rear skids, with means to vary the cutting depth as desired, and means to vary the inclination of the milling cutter in response to an automatic level detector, the cutting depth adjustments being effected by a first pair of eccentrics carrying the laterally spaced rear carriage skids,



and the level adjustments being effected by a second pair of eccentrics mounting the cutter frame.

3,664,393

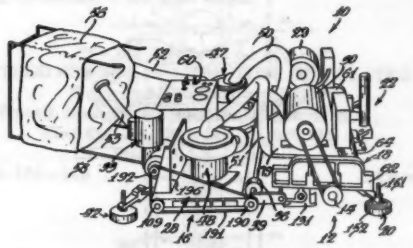
LANE RESURFACER

David P. J. McLeod, and Anthony J. Gretzky, both of Muskegon, Mich., assignors to Brunswick Corporation

Filed Dec. 23, 1969, Ser. No. 887,599

Int. Cl. B27c *1/02*

U.S. Cl. 144—117 C **10 Claims**



A lane resurfacer having a cutter carriage slidably supported on the lane to be resurfaced with a travel unit independently supported for movement on the lane and interconnected to drive the cutter carriage, with the cutter carriage having lane engaging supports spaced a short distance apart to improve resurfacing accuracies, and with a selective locking linkage, locking the cutter carriage to the travel unit as a portion of the carriage support goes over the end of the lane to maintain an accurate resurfacing to the tail plank of the lane.

3,664,394

DOUBLE HEAD NOTCHING MACHINE

Sylvan O. Wells, Springfield, Mo., assignor to Kenwal Machine Company, Inc., East Harrison, Republic, Mo.

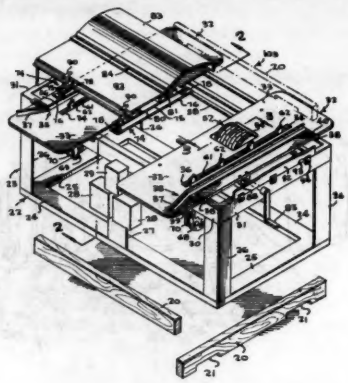
Filed Nov. 14, 1969, Ser. No. 876,795

Int. Cl. B27c *5/06*

U.S. Cl. 144—133 R **3 Claims**

A double head notching machine for pallet stringers

wherein there is provided a pair of cutting heads, a crank ad-



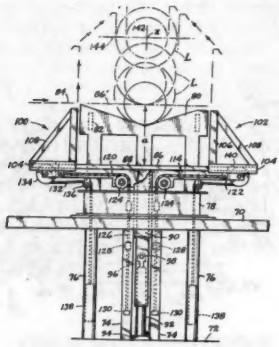
justment, spring loaded hold down mechanisms, and a feed mechanism.

3,664,395

LOG PRE-CENTERING APPARATUS FOR VENEER LATHES

Gaylard O. Reed, Portland, Oreg., assignor to Salem Equipment, Inc., Salem, Oreg.

Filed Apr. 3, 1970, Ser. No. 25,388
Int. Cl. B27l *5/02*
U.S. Cl. 144—209 A **14 Claims**



Each of a pair of independently, vertically movable log-supporting bases mounts a pair of opposed knees for confining a log between them. The knees are movable horizontally inward in direct proportion to the vertical movement of the associated base, so that when the confronting faces of the knees are brought into abutment with a log supported on the bases the axial centerline of the log is aligned with the axial center of log transfer mechanism which, in turn, is aligned with the rotational axis of veneer lathe chucks in the log transferring position of said mechanism.

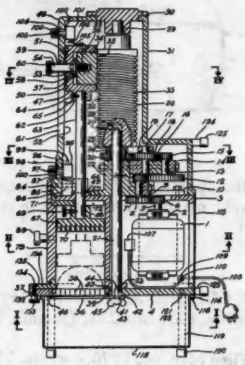
3,664,396

DICING MACHINE

Gerard A. Tremblay, 2780 Jeanne D'Arc Ave., Apt. 1, Montreal 403, Quebec, Canada

Filed Jan. 4, 1971, Ser. No. 103,430
Int. Cl. B26d *3/26*
U.S. Cl. 146—78 A **8 Claims**

A reversible motor is connected through a speed reducing drive train to rotate a worm having pitched and pitchless grooves to advance intermittantly a ram mounted pressing head within a box fastened to a face plate holding interchangeable cutting frames and orificed plates to produce desired protrusions; the same drive train to rotate a shaft to which attach interchangeable cutting knives to revolve flush with the outward face of said face plate to sever the extrusions only upon the stationary position of said pressing head. The length of the extrusions for dicing is determined by the distance between the centers of the pitched and pitchless grooves of said worm, which is equal to the spacing between



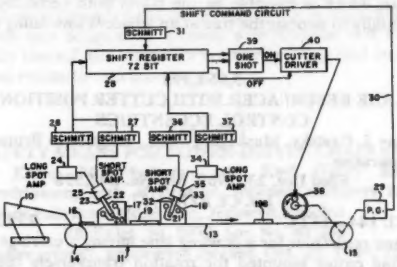
the blades disposed in quadrillations of the specific cutting frame chosen to produce said square extrusions. Reversing the rotation of the motor retracts the pressing head to its starting position in the box. A motor switch supplies electrical power to the motor and its direction of rotation is controlled by a forward reverse switch actuated by the closing and opening of the box door. A forward rotation limit switch stops the motor automatically at the completion of a full extrusion cycle and a reverse rotation limit switch stops the motor automatically at the completion of a full retracting cycle.

3,664,397

APPARATUS AND METHOD FOR DETECTING AND PROCESSING MATERIALS ACCORDING TO COLOR OR SHADE VARIATIONS THEREON

George W. Raye, Noroton, Conn.; Henry J. Dumas, Jr., Framingham, Mass., and Lloyd N. Duncan, Caribou, Maine, assignors to American Kitchen Foods, Inc., Greenwich, Conn.

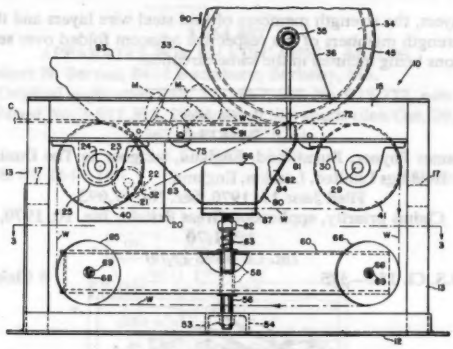
Original application Mar. 9, 1966, Ser. No. 533,037, now Patent No. 3,543,035. Divided and this application Mar. 24, 1970, Ser. No. 24,907
Int. Cl. B26d *5/06*
U.S. Cl. 146—117 R **5 Claims**



A rotary cutter for use in an apparatus for the inspection and removal of defects from strip-like articles in which the

cutter is a rotary driven member having a plurality of slots containing blade members which are capable of movement between a retracted position and a cutting position and are activated to a cutting position in response to signals from an inspection device.

3,664,398
MUSHROOM SLICER
Richard E. Moyer, 2815 Baird Road, Fairport, N.Y.
Filed Jan. 7, 1971, Ser. No. 104,657
Int. Cl. B26d *4/06*
U.S. Cl. 146—129 R **15 Claims**

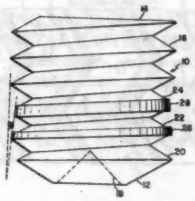


An endless wire is wound a plurality of times around a pair of spaced parallel drums and two pulleys whose axes are inclined to the axes of the drums. Each drum has in its periphery a plurality of axially spaced grooves for guiding the upper reaches of the wire in closely spaced relation. A third rotary, grooved drum is disposed above the upper reaches of the wire and in operative relation thereto. The mushrooms, which are to be sliced, are fed, their stems parallel to the upper reaches of the wire, into the nip between said upper reaches, and the third drum. The third drum forces an advancing mushroom downwardly through the upper wire reaches slicing mushrooms simultaneously into a plurality of slices of uniform thickness.

3,664,399
GOLF CLUB HEAD PROTECTOR
Samuel G. Neff, River Road Route #2, Beaver Falls, Pa.
Filed Feb. 18, 1970, Ser. No. 12,398
Int. Cl. B65d *65/02*
U.S. Cl. 150—1.5 R **8 Claims**

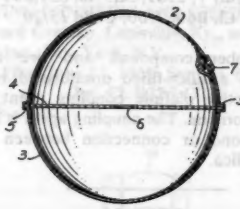
This disclosure pertains to a protector for the heads of the wooded golf clubs of a set of clubs which is mounted on the conventional tube carried in golf bags for receiving the golf club. This protector has cooperating cover and body portions for housing and protecting the heads of the "woods" golf clubs and a shank portion which partially encircles the shaft of the club so as to expose a portion of the shaft for affording easy access thereto for quick removal of the club from the tube and the protector when the cover portion is in its open position. The protector is capable of adjustment with respect to the tube to accommodate clubs of different lengths and golfers of different heights.

3,664,400
LOCKING SET SCREW
Harrington Moore, Newbury, Mass., assignor to George W. Moore, Inc., Waltham, Mass.
Filed Mar. 2, 1970, Ser. No. 15,522
Int. Cl. F16b *39/30*
U.S. Cl. 151—22 **3 Claims**



A locking set screw is provided by forming a screw with threads of conventional configuration and then rolling two or more of the thread crests on a taper. The taper-rolled threads bite into the threads of a nut or other tapped part to which the screw is threaded and with tapered rolling the locking connection of one thread is in a different plane from the locking connection of the other thread.

3,664,401
METHOD FOR THE MANUFACTURE OF INFLATED ARTICLES
Louis Trovati, Lyon, France, assignor to Dodelino S.A.
Filed Oct. 24, 1969, Ser. No. 869,318
Int. Cl. B32b *31/06*
U.S. Cl. 156—145 **5 Claims**



A method of manufacturing inflated articles of plastics materials, of which the shapes and volumes are obtained by controlled over-extension of the plastics films, consists in fabricating a central section of the article by a film or a sheet of substantially unelastic plastics material, having a coefficient of extensibility as low as possible. The periphery is made to correspond to the profile of the desired section, this film being sandwiched between two films of plastics material of the same shape, to whose edges it is bonded by welding. At least, one film comprises an inflating valve. The article is inflated to a definite pressure by the desired deformation of the outer films as a function of their nature and their thickness, the balancing of the inflating pressures, on each

side of the central film being ensured by a communicating orifice arranged at the center of the central film. Preferably, the orifice arranged at the center of the central film has a profile geometrically similar to that of the section of the fabricated article through the said central film, e.g. circular. The cutting out and welding of the films may be effected in a single operation. The plastics material may be polyvinyl chloride.

3,664,402

TREAD FOR HEAVY-DUTY RADIAL-CARCASS TIRE

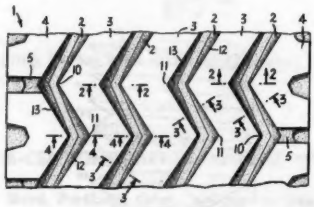
Jean B. Montagne, Cebazat, France, assignor to Compagnie Generale Des Etablissements Michelin raison sociale Michelin & Cie, Chermont-Ferrand (Puy-de-Dome), France

Filed June 15, 1970, Ser. No. 46,282

Claims priority, application France, June 19, 1969, 6920626

Int. Cl. B60c *11/04, 11/06*

U.S. Cl. 152—209 **6 Claims**



A tire tread formed with circumferential zigzag ribs bordered by circumferential zigzag grooves is characterized in that the lateral walls of the ribs have a variable inclination with respect to the perpendicular to the tread. The minimum inclination is close to and on the side of portions of the ribs that project with respect to the grooves, and the maximum inclination is close to and on the side of portions of the ribs that are re-entrant with respect to the grooves.

3,664,403

VULCANIZED RUBBER COMPRISING A SILICEOUS PIGMENT, A RUBBER AND AN ORGANIC COUPLING AGENT HAVING AN ACTIVE OLEFINIC LINKAGE

Thomas J. Doran, Norton; Melvin P. Wagner, Barberton, and Henry C. Stevens, Akron, all of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed July 7, 1969, Ser. No. 839,644

Int. Cl. B60c *5/00;* **C08d** *13/20*

U.S. Cl. 152—330 **14 Claims**

The novel rubber compound and tire tread made therefrom include a silica-filled unsaturated rubber compound and a reactive olefinic coupling agent such as 5-triethoxysilyl norbornene. The coupling agent is a compound which forms a bond or connection between the rubber polymer and the silica.

3,664,404

PNEUMATIC VEHICLE TIRE

Georg Twardzik, Marienhagen, Germany, assignor to Continental Gummi-Werke Aktiengesellschaft, Hannover, Germany

Filed June 8, 1970, Ser. No. 44,061

Claims priority, application Germany, June 9, 1969, P 19 29 174.8

Int. Cl. B60c *9/20*

U.S. Cl. 152—361 **1 Claim**

A pneumatic tire with a belt extending over the width of the tread strip and comprising two superimposed laterally free ending steel wire layers with the strength members of one of said layers extending in one inclined direction and with the strength members of the other one of said layers extending in the oppositely inclined direction while between said two cord fabric layers of the belt within the marginal regions thereof there are interposed folded textile cord fabric

layers, the strength members of said steel wire layers and the strength members of the respective adjacent folded over sections being inclined in the same direction.

3,664,405

WHEELS

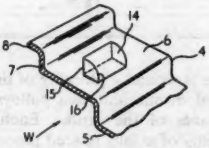
James Poyner, Burntwood, England, assignor to The Dunlap Holdings Limited, London, England

Filed June 17, 1970, Ser. No. 47,093

Claims priority, application Great Britain, Jan. 10, 1970, 1,311/70

Int. Cl. B60b *25/00*

U.S. Cl. 152—375 **6 Claims**



A wheel for a pneumatic tire, particularly for use on racing cars, provided with at least one localized projection axially inwards of the wheel rim for preventing axially inwards displacement of the tire bead from the wheel rim flange and into the wheel well. Preferably the projections are members welded to the rim and formed with axially outward tire bead toe abutment faces and axially inwards sloping faces to assist tire fitting.

3,664,406

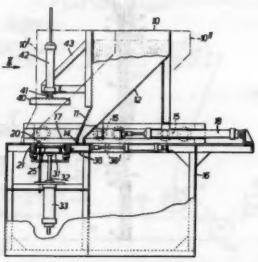
MOLD MAKING MACHINES

Desmond Leonard Mawson, Sherwood, Aston near Sheffield, and Bernard Malone, Mytchett, Camberley, both of England, assignors to Hooker Chemical Corporation, Niagara Falls, N.Y.

Filed Dec. 1, 1969, Ser. No. 881,276

Int. Cl. B22c *13/02, 5/12*

U.S. Cl. 164—161 **11 Claims**



An apparatus is provided for use in producing shell molds particularly suited to stack molding operations. In one em-

bodiment, there is provided an electrically heated pressure plate which is arranged above the pattern frame so that it can be lowered by means of a pneumatic cylinder to compact and cure granular material treated with a bonding agent, such as resin coated sand, in the core box. In another embodiment in which the apparatus is used to make hollow shell molds, the heater plate above the core box is replaced by an electrically heated or gas heated hood. In this arrangement, the pattern frame is hinged so that it can be inverted to remove surplus sand from the pattern frame, after which the heated hood is lowered by means of a pneumatic cylinder to a position over the pattern frame to cure the back of the shell mold. The resulting cured sand molds are ready for immediate use in stack molding without further handling.

3,664,407

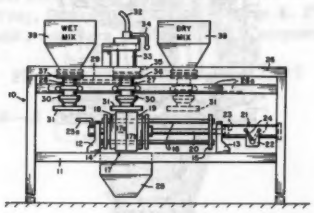
APPARATUS FOR MAKING SHELL MOLDS

Robert H. Barron, 8414 Buckthorn, Berkeley, Mo.

Original application Feb. 27, 1967, Ser. No. 618,772, now Patent No. 3,511,302. Divided and this application Oct. 20, 1969, Ser. No. 870,706

Int. Cl. B22c *13/08*

U.S. Cl. 164—165 **9 Claims**



The subject shell mold consists of applying dry molding sand the granules of which are coated with a resin binder to a heated pattern to render the sand capable of faithfully reproducing the shape of the pattern with as thin a facing layer of the binder treated sand as is possible so that the least amount of finer grades of sand are used to make a mold as thin as possible. The subject shell mold is the product or the result of a process in which the formation of the shell mold, before its removal, has applied thereto a wet backfill mixture of refractory media and an air-set binder as a backing to the shell to render it rigid for withdrawal from the pattern and strong enough to stand up during the pouring of molten metal and its solidification. Thereafter the mold is intended to break down so that the material may be easily separated from the solidified casting. The resulting shell mold is gas permeable and obtains high fidelity of pattern shape reproduction and dimensions.

3,664,408

DEVICE FOR FASTENING A PATTERN PLATE TO A MOLD TABLE OR BOX

Helmut Eibe, Offenbach am Main, Germany, assignor to Roland Offsetmaschinenfabrik Faber & Schleicher AG, Offenbach am Main, Germany

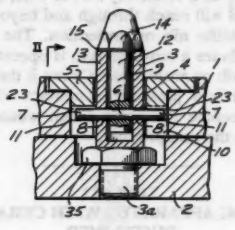
Filed June 2, 1970, Ser. No. 42,842

Claims priority, application Germany, June 4, 1969, P 19 28 362.6

Int. Cl. B22c *7/04*

U.S. Cl. 164—241 **14 Claims**

A pattern plate is releasably fastened to a mold table or box of a molding machine in a locally fixed position by extending a guide or locating pin through a suitably dimensioned and located guide hole in the pattern plate, and providing a cam follower riding on a helicoidal surface provided on or coacting with one of the two parts to be fastened to each other. Turning of the cam follower and the helicoidal



surface relative to each other causes pulling of the table or box and of the pattern plate against each other.

3,664,409

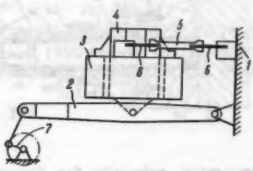
MOLD ROCKING MECHANISM IN A CONTINUOUS METAL CASTING PLANT

Adolf Petrovich Kolomeitsev, ulitsa Ilicha, 4, kv.2, and Vladimir Igorevich Kulikov, prospekt Ordzhonikidze, 3, kv.I, both of Sverdlovsk, U.S.S.R.

Filed Aug. 8, 1969, Ser. No. 848,478

Int. Cl. B22d *11/02*

U.S. Cl. 164—260 **4 Claims**



A mold-rocking mechanism installed in a continuous metal casting plant, comprises a system of pivotal links on which is mounted a frame carrying the mold. The link system includes links which resist only forces directed along their axes and these links are attached to the frame and to the framework of the plant by means of flexible members.

3,664,410

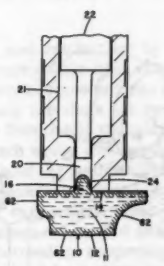
DIE CASTING DENSIFIER AND EJECTOR APPARATUS

Daniel Edward Groteke, Louisville, Ky., assignor to American Standard Inc., New York, N.Y.

Filed June 12, 1969, Ser. No. 833,912

Int. Cl. B22d *17/22*

U.S. Cl. 164—303 **6 Claims**



Covers metal casting methods and apparatus to minimize the formation of voids and to improve the quality of the final cast product. The casting mold, which is preferably posi-

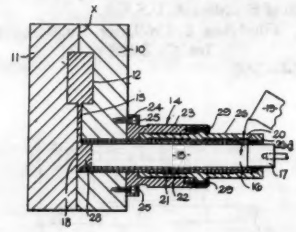
tioned adjacent to other parts of the casting apparatus, is provided with an opening preferably adjacent to a "hot spot" of the casting space where the poured metal would be expected to solidify at a relatively slower rate, so that some of the molten metal will reach through and beyond the opening and form a metallic nib or projection. The casting equipment, which includes a movable rod, is operated to drive the rod against the nib or projection to force it through the opening surface and into pressurized contact with the casting material to overcome the voids which would otherwise be produced within the cast product.

3,664,411

DIE-CASTING APPARATUS WITH CERAMIC SHOT DUCT LINER

Bryan George Carver, Birmingham, and Ronald Crooks, Wolverhampton, both of England, assignors to G.K.N. Group Services Limited, Warley, England

Filed Oct. 19, 1970, Ser. No. 82,220
Claims priority, application Great Britain, Oct. 25, 1969, 52,378/69
Int. Cl. B22d *17/10*
U.S. Cl. 164—312 **9 Claims**



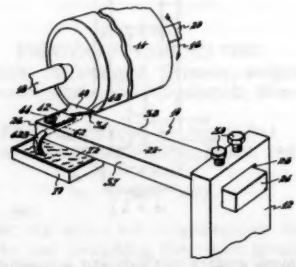
Die-casting apparatus, primarily for ferrous metals, in which the shot duct comprises a ceramic liner supported by a casing, the liner and the casing being of complementary tapered form and assembled together as a press fit. The casing may be shrunk onto the liner and may be so dimensioned that, at the working temperature, the liner is under radial compression.

3,664,412

COOLING SYSTEM FOR CUTTING TOOL AND THE LIKE

Ronald D. Zerkle, Cincinnati, Ohio, assignor to Neal P. Jeffries, Cincinnati, Ohio, a part interest

Original application Apr. 4, 1968, Ser. No. 718,772, now Patent No. 3,571,877, dated Mar. 23, 1971. Divided and this application Dec. 22, 1970, Ser. No. 100,589
Int. Cl. F28f *13/00*
U.S. Cl. 165—1 **2 Claims**



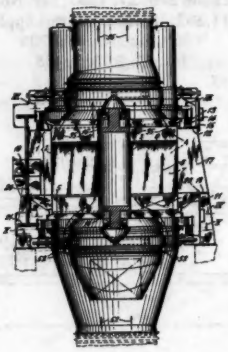
A cutting tool cooling system including a cutting tool having an external cutting edge and an internal cavity with a heat receiving surface in heat exchange and fluid sealed relationship to the cutting edge, and a coolant in the cavity vaporizable at the cavity heat receiving surface for extracting heat therefrom and thereby cooling the tool cutting edge.

3,664,413

COLLECTION HEAT EXCHANGERS FOR GASEOUS FLUIDS IN GENERAL, PARTICULARLY HEATERS OF BURNING AIR FOR STEAM HEATERS IN MARINE AND LAND INSTALLATIONS

Carlo Bo, Genoa, Italy, assignor to Ansaldo Meccanico-Nucleare S.p.A., Genoa, Italy

Filed Nov. 10, 1969, Ser. No. 875,313
Claims priority, application Italy, May 31, 1969, 7079 A/69
Int. Cl. F28d *17/04*
U.S. Cl. 165—4 **12 Claims**



A regenerative heat exchanger of the type used in heating air for furnaces by the heat of gaseous combination products comprises a stationary cylindrical casing divided by flat radial walls into a plurality of like compartments. Regenerative material occupies central portions of the compartments while leaving distribution spaces at opposite ends. The cylindrical casing is disposed between two stationary concentric pipe connections at opposite ends of the casing for supplying, transporting and discharging the air and combustion products respectively. Valving of the gas and air successively to the several compartments containing the regenerative material is effected by circular flat plates disposed at opposite ends of the cylindrical casing and between the casing and the pipe connections. Each plate has at least one port for each of the gaseous fluids disposed facing the respective pipe connection. The plates are rotatably supported and are driven in synchronism with one another. Sealing means is provided between the plates, cylindrical casing and pipe connections.

3,664,414

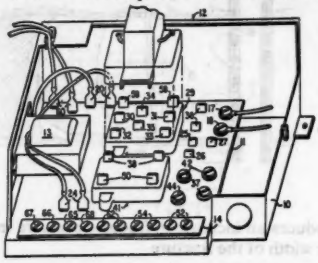
FURNACE HAVING MULTIPLE SPEED MOTOR AND ACCESSORY CONTROL SYSTEM

William F. Raleigh, Hacienda Heights, Calif., assignor to Carrier Corporation, Syracuse, N.Y.

Original application July 23, 1969, Ser. No. 827,223. Divided and this application July 6, 1970, Ser. No. 60,985
Int. Cl. F25b *29/00*
U.S. Cl. 165—/26 **2 Claims**

A heating and cooling system including a furnace having a control module comprising a prewired printed circuit board having a pair of line voltage conductors connected to the primary winding of a power transformer and a pair of low voltage conductors connected to the secondary winding of a power transformer. Terminal means are provided for connecting a plug-in fan relay and a thermostat in the low volt-

age circuit. Additional terminal means are provided for connecting a fan motor and a humidifier and humidifier relay to the line voltage circuit. Terminal means are also provided in conjunction with a double-pole, double-throw fan motor



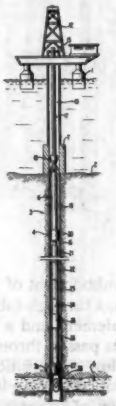
relay switch for connecting an air cleaner accessory unit to the circuit. The circuit is arranged to provide the desired optimum programing of control functions with any combination of accessories.

3,664,415

METHOD AND APPARATUS FOR TESTING WELLS

Gary Q. Wray, Duncan, Okla., and George E. Petty, Montalve, Calif., assignors to Halliburton Company, Duncan, Okla.

Filed Sept. 14, 1970, Ser. No. 71,695
Int. Cl. E21b *27/00*
U.S. Cl. 166—.5 20 Claims



A method and apparatus for testing offshore wells where variations in well annulus pressure are utilized to control the valving operation of a testing tool and entrap a formation sample.

A confined body of pressurized fluid positioned in a testing string is utilized to predetermine the annulus pressure changes which will effect said valving and sample entrapping operations.

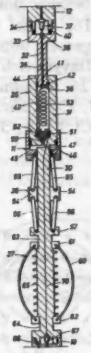
3,664,416

WIRELINE WELL TOOL ANCHORING SYSTEM

Yves Nicolas, Versailles, and Jean-Loup Bonnet, Essonne, both of France, assignors to Schumberger Technology Corporation, New York, N.Y.

Filed June 1, 1970, Ser. No. 42,179
Claims priority, application France, June 3, 1969, 6918133
Int. Cl. E21b *23/00*
U.S. Cl. 166—65 8 Claims

An illustrative embodiment of the present invention includes apparatus for use in anchoring a probe in a well bore. The apparatus includes a body member which is attached to the upper part of the probe. A ballast weight is telescopically mounted on the body member and is attached to the wireline cable for operating the device. Movement of the ballast



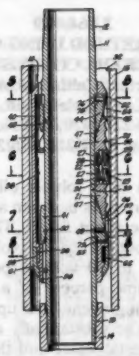
weight is amplified by a force multiplying hydraulic system and utilized to spread anchoring means outwardly against the wall of the well bore. A surface-actuated solenoid control valve may be utilized to control the anchoring system.

3,664,417

TUBING ANCHOR AND CATCHER

Martin B. Conrad, 1980 Paquita Drive, Carpinteria, Calif.

Filed Sept. 4, 1970, Ser. No. 69,664
Int. Cl. E21b *23/00*
U.S. Cl. 166—216 19 Claims



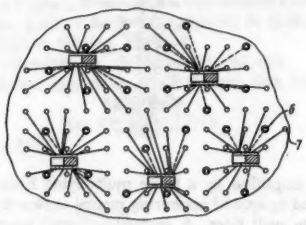
A tubing anchor and catcher set by rotary motion of a threaded mandrel employs slip-cone rings on the mandrel to move wedge slip members outward into engagement with the casing. The wedge slip members are interfitted with friction dragblock members frictionally engaging the casing. Springs confined between each wedge slip member and its respective dragblock member hold the wedge slip member in retracted position against the mandrel surface and move the dragblock member into casing engagement while running in the hole. The wedge slip members are carried directly on the slip-cone rings without any intermediate supporting member. An emergency release is provided by a shear ring between the mandrel and one of the slip-cone rings. In the modified form of the device, an emergency release is provided by continued turning of the mandrel in the same direction used to set the wedge slip members, to shear the ring.

3,664,418

METHOD FOR THE DEVELOPMENT OF OIL FIELDS HAVING ZONALLY NON-UNIFORM COLLECTOR PROPERTIES

Valery Isaakovich Graifer, ulitsa Parizhskoi Kommuny, 17, Almetievsk; Alexandr Ivanovich Komarov, ulitsa Korobkovskogo, 66, kv. 6; Vladimir Dmitrievich Lysenko, ulitsa Tukaeva 75-a, kv. 16, both of Bugulma; Ravkhat Shagimardanovich Mingareev, ulitsa Bronnaya, 29, kv. 75, Moscow, and Enver Davydovich Mukharsky, ulitsa G. Gafiatullina, 55-V, Kv. 26, Bugulma, all of U.S.S.R.

Filed Mar. 17, 1970, Ser. No. 20,271
Int. Cl. F21b *43/16*
U.S. Cl. 166—245 3 Claims



A method for the development of oil fields, having zonally non-uniform collector properties, which method consists in that after the industrial drilling of the field, some individual sections comprising at least one injection well surrounded by production wells are selected for the independent development of the oil field, the injection well or wells passing through the maximum number of productive formations completed by said production wells.

3,664,419

OIL RECOVERY METHOD USING CRUDE OIL BASE SOLUBLE OIL COMPOSITIONS

Leroy W. Holm, Fullerton, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed July 22, 1970, Ser. No. 57,327
Int. Cl. E21b *43/22*
U.S. Cl. 166—274 16 Claims

Improved crude oil base soluble oils are prepared from crude oils exhibiting gravities between about 27° and 50° API and pour points below about 55° F. These soluble oil compositions contain about 45 to 90 volume percent of the selected crude oil, 4 to 30 volume percent surface active agents, 0.5 to 8 volume percent of a partially oxygenated liquid organic stabilizing agent, and up to about 60 volume percent water. Both the substantially anhydrous soluble oil containing only incidental water and the high water content microemulsions formed by the addition of from about 10 to 60 volume percent water to the soluble oil can be employed as miscible flooding agents for oil recovery and as water injection and producing oil well treating agents.

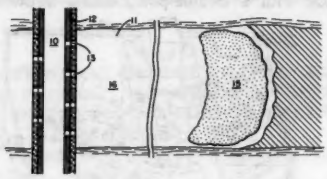
3,664,420

HYDRAULIC FRACTURING USING PETROLEUM COKE

John W. Graham; Othar M. Kiel; William M. Terry, and Albert R. Sinclair, all of Houston, Tex., assignors to Esso Production Research Company

Filed Aug. 17, 1970, Ser. No. 64,338
Int. Cl. E21b *43/26*
U.S. Cl. 166—280 11 Claims

A fluid containing suspended particles of petroleum coke is injected into a fracture formed in a subterranean formation. The injection conditions are such that the coke particles are carried to the ends of the fracture where they screen out and form low permeability zones. Continued injection of a



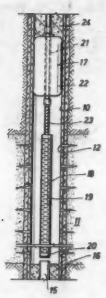
fluid produces an increase in fracture pressure increasing the dynamic width of the fracture.

3,664,421

METHODS FOR INHIBITING THE PRODUCTION OF LOOSE FORMATION MATERIALS

Harold J. Urbanosky, Pearland, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Sept. 18, 1970, Ser. No. 73,277
Int. Cl. E21b *33/134, 43/04*
U.S. Cl. 166—278 9 Claims



As a representative embodiment of the methods of the invention disclosed herein, a through-tubing bridge plug having an expansible packing element and a tubular screen dependently coupled thereto is passed through a production string into a well bore therebelow and positioned adjacent to a perforated formation interval containing loose formation materials. The initial production of connate fluids from the well is controlled at a reduced rate for slowly drawing loose formation materials into the perforated well bore interval to at least substantially fill the annular space around the tubular screen with such formation materials. Then, once it is believed that the annular space around the tubular screen is filled with such loose formation materials, production of the well is commenced in the usual manner with the packed formation materials around the screen serving as a filter media to inhibit the entrance of further formation materials into the well bore.

3,664,422

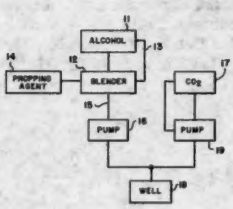
WELL FRACTURING METHOD EMPLOYING A LIQUIFIED GAS AND PROPPING AGENTS ENTRAINED IN A FLUID

Ronald S. Bullen, Calgary, Alberta, Canada, assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Aug. 17, 1970, Ser. No. 64,271
Int. Cl. E21b *43/26*
U.S. Cl. 166—283 14 Claims

The formations surrounding a well bore are subjected to

hydraulic fracturing. A liquified gas and a fluid containing entrained propping agents are injected into the formations.



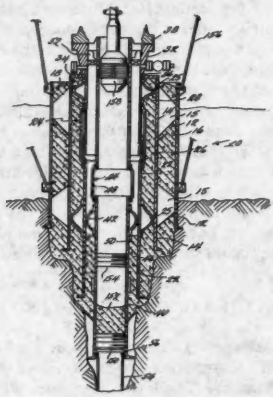
The liquified gas returns to its gaseous state and is therefore easily removed from the formation.

3,664,423

TIE-BACK SYSTEM FOR UNDERWATER COMPLETION

Marvin L. Holbert, Jr., Houston, Tex., assignor to Gray Tool Company, Houston, Tex.

Filed Mar. 23, 1970, Ser. No. 21,980
Int. Cl. E21b *29/00*
U.S. Cl. 166—297 7 Claims



The tie-back collar of an inner casing is provided with a protector sleeve which is sealed in place and supported against rotation. To temporarily abandon the well after the annulus between the inner and an outer string has been fully cemented up past the tie-back collar, the inner and outer strings are severed with a casing cutter above the tie-back collar. When tying back into the well, a spear may be used to retrieve the remaining part of the protector and a thread-in or stab-in tie-back sub may then be connected to the inner string to reestablish communication with the well.

3,664,424

METHOD FOR INSULATING A WELL

Walter L. Penberthy, Jr.; Jack H. Bayless, and Robert C. West, all of Houston, Tex., assignors to Esso Production Research Company

Filed Dec. 21, 1970, Ser. No. 100,462
Int. Cl. E21b *43/24*
U.S. Cl. 166—303 10 Claims

An improved method for thermally insulating a well for use in a thermal process for oil recovery. In a process for forming a coating of alkali metal silicate on a tubing string within the well, excess alkali metal silicate solution is displaced from the tubing-well annular space by a fluid having a low solubility for the silicate coating.

3,664,425

WELL INSULATION METHOD

Walter L. Penberthy; Jack H. Bayless, and Robert C. Ayers, Jr., all of Houston, Tex., assignors to Esso Production Research Company

Filed Dec. 21, 1970, Ser. No. 100,499
Int. Cl. E21b *43/24*
U.S. Cl. 166—303 10 Claims

A method for thermally insulating a well which may be used in a thermal process for oil recovery. The well is insulated by boiling a solution containing a water-soluble alkali metal silicate and a foaming agent in contact with the well tubing to form a coating of alkali metal silicate on the tubing. The foaming agent assists in removing excess silicate solution from the well annulus and improves the quality of the coating on the tubing.

3,664,426

HYDRAULIC FRACTURING METHOD

Martin E. Chenevert, Houston, Tex., assignor to Esso Production Research Company

Continuation-in-part of application Ser. No. 726,693, May 6, 1968, now abandoned , which is a continuation-in-part of application Ser. No. 675,490, Oct. 16, 1967, now abandoned , and a continuation-in-part of 699,255, Jan. 19, 1968, now abandoned. This application May 4, 1970, Ser. No. 34,216
Int. Cl. E21b *43/26*
U.S. Cl. 166—308 12 Claims

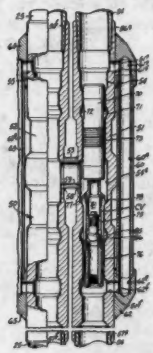
A method of fracturing water-sensitive formations is disclosed. The new method involves determining the aqueous vapor pressure of the formation and injecting a fluid having a continuous oil phase and a dispersed water phase containing a sufficient quantity of a water-soluble aqueous vapor pressure depressant therein to reduce the aqueous vapor pressure of the fluid to a level that is about equal to that of the formation into the formation at a pressure and rate sufficient to open a fracture in the formation.

3,664,427

WELL FLOW CONTROLLING SYSTEMS, METHODS AND APPARATUS

Thomas Michael Deaton, Dallas, Tex., assignor to Otic Engineering Corporation, Dallas, Tex.

Filed Nov. 23, 1970, Ser. No. 91,761
Int. Cl. E21b *23/00, 43/00*
U.S. Cl. 166—313 14 Claims



A well flow controlling system, method and apparatus for wells having a plurality of flow conductors therein for establishing flow communication between pairs of the flow conductors at a point down-hole in the well by opening normally closed valve means and positively holding the valve means open during operations of circulating or flowing fluids

through the conductors in the well until it is desired to close the valve to shut off flow communication between the pairs of conductors. The valve is pressure operable to open position by pressure of fluids in the conduits and is held open mechanically to permit the flow or circulation of fluids at pressures lower than the pressure required to open the valve. The valve is also fluid pressure operable for movement to closed position. A pressure responsive valve for controlling fluid flow between a pair of well flow conduits connected together by a cross-flow passage at a subsurface point in a well to provide U-tube flow communication between the conduits to permit circulation of fluids through the conduits to move well tools into and out of the well through one or the other of the conduits or to perform other service or production operations in the well. The valve is positively mechanically held in open position when moved to such open position to permit circulation of fluids at pressures lower than the pressures required to move the valve to open or closed positions.

3,664,428

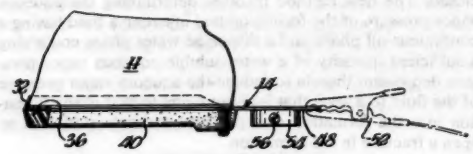
HORSESHOE MANUFACTURE ELECTRICALLY RESISTIVE HORSESHOE AND METHOD OF ATTACHMENT

Dudley W. C. Spencer, 619 Shipley Rd., Wilmington, Del.

Filed Sept. 10, 1970, Ser. No. 71,121

Int. Cl. A01l *5/00*

U.S. Cl. 168—4 **31 Claims**



A horseshoe includes an electrically resistive stiffening frame which is secured to the hoof by means of thermo accelerated adhesive. The frame is provided with tabs so that electrical power may be applied to the tabs for accelerating the curing of the adhesive.

3,664,429

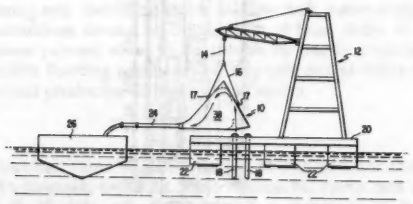
APPARATUS FOR PREVENTING POLLUTION FROM OFFSHORE OIL WELLS

Eugene G. Jones, 2637 N. Johnson St., New Orleans, La.

Filed June 7, 1971, Ser. No. 150,430

Int. Cl. A62c *3/00*

U.S. Cl. 169—2 R **8 Claims**



An apparatus for catching oil from high pressure offshore oil wells so as to prevent pollution of the adjacent water. A substantially enclosed container is provided with an entrance throat area at one end of the container, and an exit at an opposite end thereof. The incoming oil from the oil wells is deflected rearwardly by a formed front wall means whereby the oil is deflected rearwardly of an upturned marginal edge of a bottom wall for the substantially enclosed container and is removed therefrom, preferably by gravity. The bottom wall ensures that no oil spills into and pollutes the adjacent water.

3,664,430

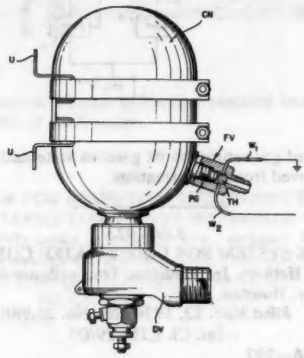
ELECTRICAL MONITOR FOR FIRE EXTINGUISHER

Abdul N. Sitabkhan, El Monte, Calif., assignor to HTL Industries, Inc., Monrovia, Calif.

Filed Oct. 6, 1970, Ser. No. 78,440

Int. Cl. A62c *39/02, 37/30*

U.S. Cl. 169—23 **11 Claims**



Covers a fire extinguisher for use on aircraft. The fire extinguisher includes a container equipped with mechanism for signalling the pilot in the cockpit in the event that the fire extinguishing fluid has been discharged through the safety relief valve of the container. The fire extinguisher is equipped with a thermally responsive material, which is positioned on or adjacent to the surface of the container and is electrically conductive. The material melts when its temperature reaches a predetermined value. The material is wired to the cockpit of the aircraft and the circuitry includes an indicating device, such as a lamp, to indicate instantly to the pilot that the fire extinguisher has been discharged and that, therefore, the fire extinguisher is not suitable for extinguishing a fire.

3,664,431

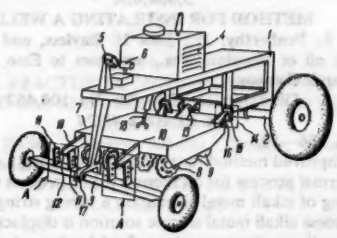
AGRICULTURAL SELF-PROPELLED HARVESTING MACHINE

Nikolai Vasilievich Tatianko prospekt Gagarina, 175, kv. 43; Alexandr Gavrilovich Tsymbal ulitsa Naberezhnaya, 9, kv. 4; Vladimir Vasilievich Stetsenko ulitsa Kharkovskikh divizy, 5, kv. 118; Sergei Alexandrovich Isikov ulitsa Matrosova, 8, kv. 49; Fedor Leontievich Rodenko poselok Zhikhor, ulitsa Tsiolkovskogo, 4; Alexandr Samuilovich Betcher ulitsa Bairona, 175, kv. 133; Petr Dmitrievich Shamrai prospekt Gagarina, 163/4, kv. 30; Mikhail Afanasievich Dulya prospekt Gagarina, 163/4, kv. 32; Viktor Vasilievich Dudka prospekt Gagarina, 163/4; Ivan Petrovich Klimchuk ulitsa Pyatigorskaya, 8, kv. 76; Anatoly Mikhailovich Dolgov, prospekt Gagarina, 169, kv. 89, all of Kharkov, U.S.S.R.

Filed July 15, 1970, Ser. No. 55,160

Int. Cl. A01d *25/04*

U.S. Cl. 171—58 **2 Claims**



In an agricultural self-propelled harvesting machine a hinge-joint connection of the fixed frame with the movable

frame which carries the working members, said hinge-joint connection enabling the movable frame to turn both round the longitudinal and the transverse axes of the machine. The front axle of the machine carries stop blocks upon which the cantilevers of the movable frame are free to rest, said stop blocks enabling the movable frame to move both horizontally and vertically depending upon the variation of the front axle position.

3,664,432

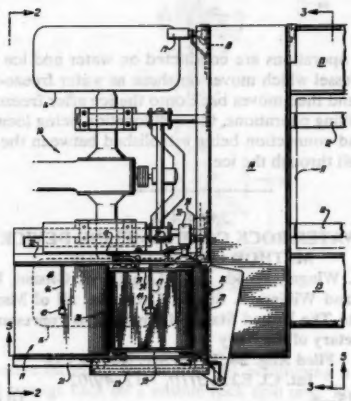
SOD HANDLING APPARATUS

John F. Nunes, Jr., 2037 Loquot Ave., Patterson, Calif.

Filed Mar. 17, 1969, Ser. No. 807,594

Int. Cl. A01b *45/04*

U.S. Cl. 172—19 **11 Claims**



A sod handling apparatus for folding sod employs a first means for engaging and advancing a length of sod relative to the apparatus while a second means for further engaging and advancing the length of sod is selectively reversible. Means are provided for detecting an appropriate moment for reversing the feeding of the forward portion of the sod. At that time, the forward feeding means is reversed and raised to form a gap through which cyclically moving surfaces travel in a common direction so as to feed the folded edge of the sod through the gap and onto a conveyor forming a continuation of the original sod path. A cross conveyor is mounted to receive the rearwardly advancing folded sod whereby workmen standing in work stations of a trailing vehicle can remove the sod and place it on a pallet or other platform within the sod carrier vehicle following the sod folding apparatus. As the folded sod is placed upon the cross conveyor, a portion of the under surface of the folded sod is not permitted to contact the cross conveyor whereby the remaining portions engage the cross conveyor and serve to twist the orientation of the line of fold of the sod commodity with respect to the direction of movement of the cross conveyor. The machine pursues a method following the steps of continuously advancing a length of sod along a path, reversing the direction of movement of one of the portions of the sod relative to the movement of another portion of the same length of sod while conjointly therewith elevating the reversed portion with respect to the other portion so as to initiate folding one of the portions onto the other.

3,664,433

STABILIZER MEANS FOR PLOW WITH STEERABLE TAILWHEEL

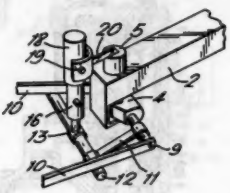
Isak T. Bo, Randaberg Pa Jaeren, Norway, assignor to A/S Kyllingstad Plogfabrik, Kleppe, Norway

Filed June 30, 1970, Ser. No. 51,228

Claims priority, application Norway, July 1, 1969, 2744/69

Int. Cl. A01b *69/08, 59/06*

U.S. Cl. 172—450 **2 Claims**



A semi-supportable plough apparatus comprises a frame carrying a number of individual plough beams and having a running wheel mounted at its rear end. A universal pivot structure comprising vertical and horizontal pivots is mounted on the frame for pivotally connecting the latter to the three-point system of a tractor. A transversely extending stabilizer rod is disposed in underlying relationship to the lower side of the draw links of a tractor and a spring mechanism interconnects the stabilizer rod and the pivot structure whereby the tendency of the frame to rotate relative to the tractor links about the horizontal pivot is yieldably limited.

3,664,434

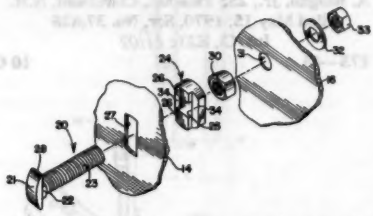
QUICK ATTACHABLE PLANTER DISK DEPTH DRUMS

Donald E. Connor, Plainfield, and Charles Boetto, Naperville, both of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed July 17, 1970, Ser. No. 55,638

Int. Cl. A01b *21/08;* **A01c** *5/06;* **F16b** *35/06*

U.S. Cl. 172—536 **1 Claim**



In a planter having furrow opener discs and depth bands to control the depth of cut of the discs, means for quickly attaching the depth bands to the discs comprising a bolt having a rectangular head and a bolt retaining member adapted to be inserted into an opening in the disc and positioned therein to receive the bolt which secures the depth band to the disc.

3,664,435

HYDRAULIC HAMMER WITH AUTOMATIC STOPPING ACTION

Ernest F. Klessig, Racine, Wis., assignor to Worthington Corporation (Worthington Compressor and Engine International Division), Holyoke, Mass.

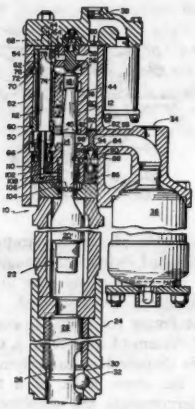
Filed Nov. 9, 1970, Ser. No. 87,965

Int. Cl. B25d *9/18*

U.S. Cl. 173—17 **8 Claims**

An improved hydraulic hammer assembly including an automatically operable system for connecting the inlet to the

outlet and bypassing the control system of the hammer when the hammer moves past a predetermined point as when the work performing element of the assembly is not in contact with the work. In the exemplary embodiment, a bypass conduit extends from the inlet to the outlet and is normally closed by a valve. When the hammer does not move past the position where it would normally encounter the tool, the application of fluid under pressure to first and third surfaces of



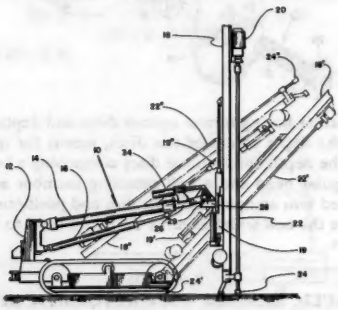
the valve maintains the valve closed notwithstanding the application of pressure to a second surface thereon in opposed hydraulic relation to the first and third surfaces. However, when the hammer moves past the position mentioned above, the third surface on the valve is vented to the outlet and the application of fluid under pressure to the second surface causes the valve to open to establish a bypass flow path for the hydraulic fluid which avoids entirely the control system used to control reciprocation of the hammer.

3,664,436

ADJUSTABLE MOUNTING FOR ROCK DRILLS

Michael A. Beagan, Jr., 255 Pleasant, Claremont, N.H.

Filed May 15, 1970, Ser. No. 37,628
Int. Cl. E21c *11/02*
U.S. Cl. 173—43 **10 Claims**



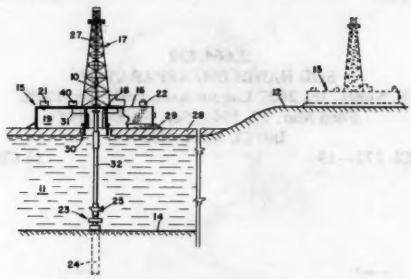
An adjustable mounting for a rock drill having a feed tilt mechanism whereby the elongated drill guide frame is pivotable by a tilt cylinder through at least 150°. This capability is made possible by the use of a cylinder rod extension having its motion controlled by a pivot arm pivotably mounted on the same yoke as is the guide frame.

3,664,437

DRILLING ON WATER AND ICE WITH A MOVABLE VESSEL

Thomas B. McCulloch, Houston, Tex., assignor to Esso Production Research Company, Houston, Tex.

Filed Jan. 23, 1970, Ser. No. 5,432
Int. Cl. E21b *7/12*
U.S. Cl. 175—5 **22 Claims**



Drilling operations are conducted on water and ice with a movable vessel which moves on shore as water freeze-up approaches and then moves back onto the ice after freeze-up to resume drilling operations, the well location being located by a signal and connection being established between the vessel and the well through the ice.

3,664,438

UNDERWATER ROCK CORE SAMPLING DEVICE AND METHOD OF USE THEREOF

Clifford L. Winget, Woods Hole; George W. Gibson, E. Falmouth, and William S. Shultz, Cataumet, all of Mass., assignors to The United States of America as represented by the Secretary of the Navy

Filed Aug. 26, 1970, Ser. No. 66,935
Int. Cl. E21b *3/10, 7/12, 49/02*
U.S. Cl. 175—6 **10 Claims**

A rotary diamond rock core drill capable of obtaining a three-quarter inch diameter core four inches long at any depth down to 6,000 feet is provided. The drill is adapted to be used with manned deep submersibles and is operated by the submersible's power supply. The drive motor is encased in an oil-filled, pressure-compensated chamber. A water pump in the drill maintains a steady low pressure flow of

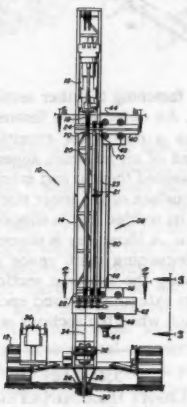
water against the sample during drilling operations, washing away rock chips and mud. The water flow may be reversed after the core has been cut, holding the specimen within the core tube as the drill is extracted from the rock outcrop. The sample is then ejected by again reversing the drive motor and pump, forcing the water flow down through the core tube and expelling the specimen.

3,664,439

INDEXING MEANS FOR DRILL ROD STORAGE RACK

Malcolm N. Council, Richardson, Tex., assignor to Gardner-Denver Company, Quincy, Ill.

Filed Oct. 2, 1970, Ser. No. 77,476
Int. Cl. E21b *19/00*
U.S. Cl. 175—85 **11 Claims**



A positive indexing mechanism for positioning a movable drill rod storage rack on a mobile rock drill unit. The storage rack includes spaced apart rack members having a plurality of receptacles for storing elongated drill rod sections laterally seriatim with respect to the axis of the drill string. The indexing mechanism includes movable plungers associated with the individual receptacles on one of the rack members and operable to be actuated by the drill rod sections when placed in the receptacles. The plungers are responsive to the absence of a drill rod section from a receptacle to engage a sliding catch mechanism for arresting the movement of the storage rack in a predetermined position for loading or unloading a drill rod section. A hydraulic control circuit associated with the storage rack and the indexing mechanism includes a selector valve and actuator device for providing positive alignment of the rack for removing a rod section therefrom or alternatively loading a rod section, which has been disconnected from the drill string, into an empty receptacle.

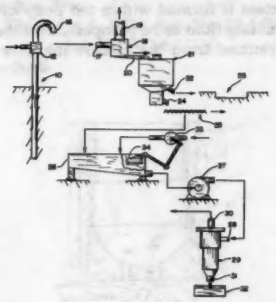
3,664,440

FORMATION CHIP SAMPLING APPARATUS

Wayland D. Elenburg, Box 1588, Monahans, Tex.

Filed Jan. 21, 1970, Ser. No. 4,546
Int. Cl. E21b *21/00*
U.S. Cl. 175—206 **11 Claims**

Formation chip sampling method and apparatus for separating solids from the liquid contained in drilling mud which has been obtained from an earth boring operation. The returned drilling mud is flow connected in series relationship to a gas separator, a splitter which reduces the amount of sample to be treated, and to a reservoir. A pump flow connects the reservoir to a cyclone type separator which removes the solids from the sample. The reservoir further includes a level controller which provides make-up liquid so as to provide the pump with optimum suction conditions.

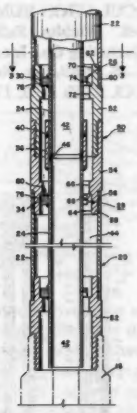


3,664,441

CONCENTRIC PIPE DRILL STRING

Paul P. Carey, Houston, Tex., assignor to Carey Machine and Supply Company, Houston, Tex.

Filed June 1, 1970, Ser. No. 42,238
Int. Cl. E21b *43/00, 21/00*
U.S. Cl. 175—215 **1 Claim**



This invention contemplates stands of concentric drill pipes with tool joints which are disconnectable from the pipes for use in oil well drilling. The removable tool joints provide means for supporting and maintaining the inner tube in coaxial relationship within the surrounding outer pipe within each stand.

3,664,442

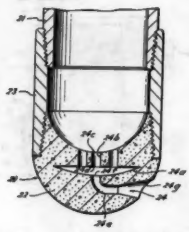
UNDERWATER PIPE POSITIONING APPARATUS

Eugene P. Rosser, and Howard I. Lorenz, both of Houston, Tex., assignors to Noble Drilling Corporation, Tulsa, Okla., by said Rosser

Filed May 11, 1970, Ser. No. 36,231
Int. Cl. F21b *9/00*
U.S. Cl. 175—231 **13 Claims**

In lowering a pipe string assembly from an above water drilling rig or platform into a subbottom well bore, a

destructible positioning and protecting device is affixed to the lower end of the pipe string assembly. Such positioning and protecting device comprises a protective closure member for closing the lower end of the pipe string assembly. A fluid passageway system is formed within the body of the closure member for enabling fluid to be pumped down the pipe string assembly and emitted from the closure member in a lateral



direction relative to the pipe string assembly for causing lateral movement of the lower end thereof, whereby such lower end may be brought into alignment with the mouth of the well bore. In some embodiments, a signal radiating device is carried within and protected by the closure member for use in ascertaining the position of the lower end of the pipe string assembly relative to the mouth of the well bore.

3,664,443

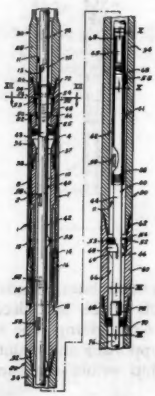
DUAL CIRCULATION BUMPER SUBS

John David Campbell, Wichita Falls, Tex., assignor to Walker-Neer Manufacturing Co., Inc., Wichita Falls, Tex.

Filed Nov. 28, 1969, Ser. No. 880,751

Int. Cl. E21b *1/10, 17/00*

U.S. Cl. 175—293 **14 Claims**



A dual circulation bumper sub comprising an outer, hollow tubular member connectable to outer tube of a string of dual tube pipe and an inner, hollow tubular member disposed inside the outer tubular member and connectable to the inner tube of a dual tube pipe string. The outer and inner tubular members have slip joints to allow vertical expansion of both the inner and outer tubular members without destroying the torque transmitting capability or the dual circulation characteristics of the dual string drilling pipe.

3,664,444

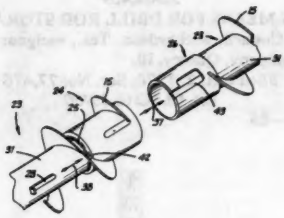
AIR DRILLING METHOD USING CONTROLLED SPLIT STREAM

William P. Henson, Indianapolis, Ind., assignor to Mobile Drilling Company, Inc., Indianapolis, Ind.

Filed May 11, 1970, Ser. No. 36,279

Int. Cl. E21b *17/046*

U.S. Cl. 175—323 **4 Claims**



A coupling for fastening together sections of an earth boring hollow auger. An outer sleeve fastened to one end of an auger section has a cavity for receiving an inner sleeve fastened to an end of an adjacent auger section. The outer sleeve has a key welded thereto and extending into a bayonet slot on the outer surface of the inner sleeve. The outer sleeve is rotated so that its welded key is slipped into a side portion of the bayonet slot. A loose key is slipped through the outer sleeve into the remaining open space of the bayonet slot locking and coupling the adjacent sections axially and radially. Helical flights extending around each section and sleeve automatically match when the sections are coupled together.

3,664,445

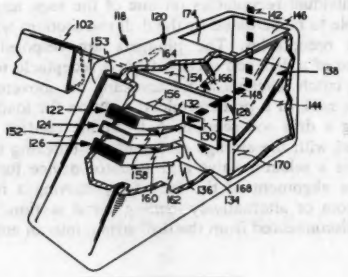
AVAILABLE LIGHT ILLUMINATED INSTRUMENT READ-OUT

Joseph P. Conklin, Fairfield, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Filed May 5, 1969, Ser. No. 821,835

Int. Cl. G01g *23/18, 23/30;* **G03b** *21/00*

U.S. Cl. 177—45 **1 Claim**



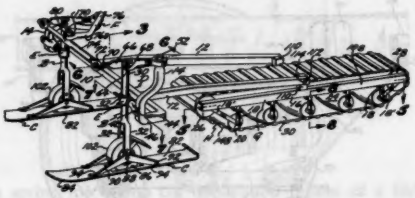
A read-out for an instrument such as a postal scale which provides either a discrete postal weight range classification or a quantitative weight read-out. The light used for this purpose is merely the available light collected by a plastic prism and internally reflected toward a back-lighted display. In the discrete form of read-out, the display includes a plurality of light pipes, each one of which represents a possible output indicator to be illuminated. Which one is illuminated depends upon the position of a mask which moves in response to the weight indication of the postal scale, and has a transparent window which lines up with the selected one of the light pipes.

3,664,446

ARTICULATED SNOWMOBILE VEHICLE

Wilson A. Burtis, 5011 Harvard Avenue, Westminster, Calif., and Thomas T. Omori, 1601 Parway Drive, Glendale, Calif.

Filed Oct. 16, 1970, Ser. No. 81,363
Int. Cl. B62m 27/02
U.S. Cl. 180—5 R 16 Claims



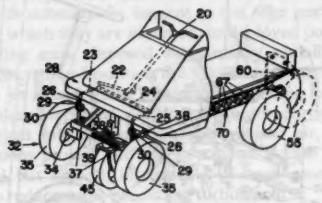
An articulated snowmobile vehicle that includes first and second frame assemblies that are pivotally connected to one another, with the first frame assembly being partially supported on snow, ice or bare ground by either skis, wheels or endless belts that are used for steering purposes, and the skis, wheels and belts being so supported that they may be pivoted laterally as well as longitudinally relative to the first frame assembly as the vehicle travels. The second frame assembly rotatably supports at least one power driven longitudinally extending endless belt of substantial width, with the lower reach of the belt being in frictional contact with the ground or snow thereon, and the belt when driven providing the motive power for the vehicle. The power driven belt when the vehicle travels over rough terrain may pivot in a vertical plane relative to the skis, wheels or steering belts due to the articulated connection between the first and second frame assemblies.

3,664,447

CONVERTIBLE SNOWMOBILE

Patrick A. Kane, Hartline, Wash.

Filed Oct. 9, 1970, Ser. No. 79,431
Int. Cl. B62m 27/02; B62d 11/08
U.S. Cl. 180—5 R 11 Claims



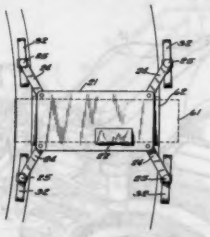
A conversion kit for adapting a snowmobile with wheels for traversing dry surfaces including wheel assemblies for replacing the front-end-supporting skiis and in addition to the conventional drive track and movable between a ground engaging position wherein the track is supported spaced upwardly from the surface and a retracted position wherein the wheels are elevated and the track is supported upon the ground. Means are provided to drive the last-named assemblies from the powered track and selectively de-clutch each driven wheel to facilitate steering.

3,664,448

VEHICLE FOR CARRYING AGRICULTURAL OR CONSTRUCTION TOOLS AND THE LIKE

Michael I. Hudis, Brookfield, Wis., assignor to Rex Chainbelt, Inc., Milwaukee, Wis.

Filed May 6, 1970, Ser. No. 35,169
Int. Cl. B62d 11/20
U.S. Cl. 180—9.46 6 Claims



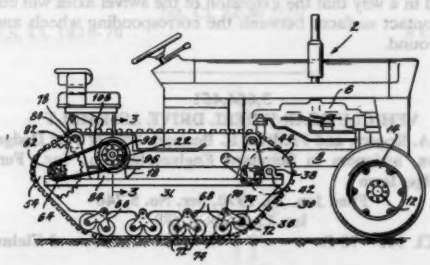
Horizontally extending legs are pivotally connected to and support the four corners of a rigid, rectangular frame. Individually driven wheeled or crawler track carriages support vertically extensible columns connected to the extended ends of the legs and are turnable for the dirigible control of the vehicle.

3,664,449

TRACK LAYING ACCESSORY FOR A TRACTOR

Joseph R. Vardell, 219 North Main Street, Kenneth, Mo.

Filed May 4, 1970, Ser. No. 34,180
Int. Cl. B62d 55/04
U.S. Cl. 180—9.48 12 Claims



Tractors having extended drive axles are provided with improved traction by removing the large drive wheels normally on those axles and replacing each of them with a track laying accessory which includes a beam having a track sprocket at one end, a guide wheel at its opposite end, and a plurality of bogie wheels along its underside. An endless track is trained over the track sprocket as well as over the guide and bogie wheels. A hub is journaled on the frame and that hub receives and is secured to the extended drive axle of the tractor in the same manner as a conventional wheel hub. The hub and track sprocket are connected through a chain-and-sprocket drive which affords the tractor the same ground speed as the wheel the accessory replaces.

3,664,450

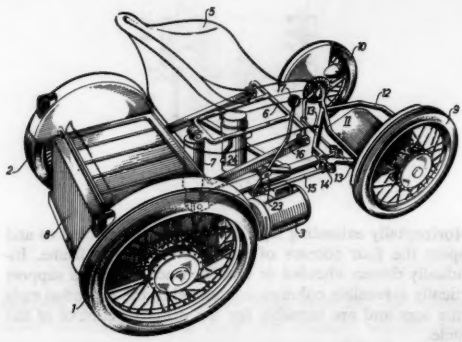
ELECTRICALLY POWERED FOUR-WHEELED SINGLE VEHICLE

Per Edward Carl Udden; Bert Hjalmar Engman, and Siegfried Graf, all of Box 90, 861 00 Timra, Sweden

Filed June 1, 1970, Ser. No. 42,116
Claims priority, application Sweden, June 2, 1969, 7712/69
Int. Cl. B60k 1/00; B60l 11/18
U.S. Cl. 180—65 R 4 Claims

Electrically powered four-wheeled single vehicles especially for disabled persons and invalids and specifically made

for out-door use must have such stabilizing qualities that under all circumstances there is no risk for the chair to turn over even if it will have to force different kind of obstacles such as curbs. A further object of such vehicles is to provide a simple and safe steering operation so that the forces from the obstacles to be forced must not be transmitted to the steering handle, since patients in many cases have considerably reduced power to control such forces by hand.



These objects are realized in the present invention substantially by the fact that the vehicle comprises a rear and a front portion which are swingably connected to each other by means of telescopic pipes or the like running substantially in parallel with the ground and in the longitudinal direction of the vehicle. To meet the requirement of a safe and unaffected steering operation the front wheels are neutrally positioned in a way that the extension of the swivel axles will cut the contact surfaces between the corresponding wheels and the ground.

3,664,451

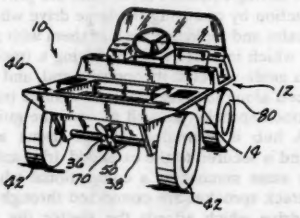
VEHICLE REAR WHEEL DRIVE ASSEMBLY

John A. Rogers, and Fredrick R. Bossard, both of Fort Dodge, Iowa, assignors to Standard Engineering Co., Inc., Fort Dodge, Iowa

Filed Jan. 26, 1970, Ser. No. 5,740

Int. Cl. B60k *17/28*

U.S. Cl. 180—70 R **3 Claims**



A vehicle having front and rear body sections rotatably interconnected along the longitudinal axis of the body sections. An engine is located in the front body section and a drive shaft extends through the coupling between the body sections through the compartment of the rear body section and to a gear box on a rear axle located entirely outside of the compartment of the rear body section. The rear axle is supported by frame members extending rearwardly from the rear body section. A wall extends horizontally over the rear axle and provides a seat for the compartment in the rear body section. A propeller may be connected to a drive shaft extending rearwardly from the gear box on the rear axle.

3,664,452

AXLE SUSPENSION FOR AUTOMOTIVE VEHICLES

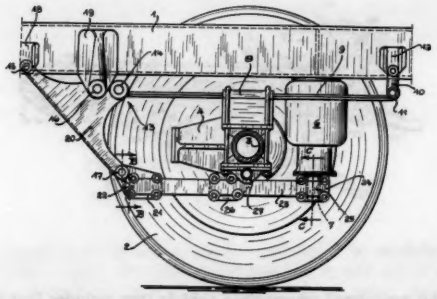
Friedrich Schaeff, Am Hollberg 19, Bensheim-Auerbach, Germany

Filed Dec. 4, 1969, Ser. No. 882,159

Claims priority, application Germany, Dec. 4, 1968, P 18 12 634.6

Int. Cl. B60g *9/00, 11/12, 11/34*

U.S. Cl. 180—71 **8 Claims**



In automotive vehicles, in order to ensure that the engine stub shaft and the differential stub shaft (both connected with the drive shaft by universal joints) form identical angles with the drive shaft at all times during springing motions of the driven axle, the latter is mounted on the vehicle chassis by means of a quadrilateral suspension. One side of said suspension is a vertically pivotable axle bracket made of a horizontally flexing leaf spring that carries the axle tube and an air spring engaging said chassis; an opposite side of said suspension is a vertically flexing leaf spring held at its ends and attached at its mid portion to said axle tube.

3,664,453

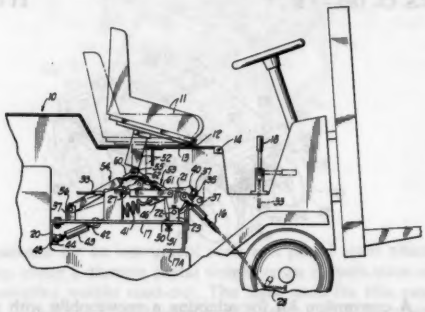
DEADMAN SEAT ACTUATED BRAKE AND HANDBRAKE CONSTRUCTION

Samuel H. Cottrell, Mound, and Sam R. Montgomery, Minnetonka, both of Minn., assignors to White Farm Equipment Company

Filed June 8, 1970, Ser. No. 44,385

Int. Cl. B60t *7/00;* **F16d** *65/30*

U.S. Cl. 180—101 **14 Claims**



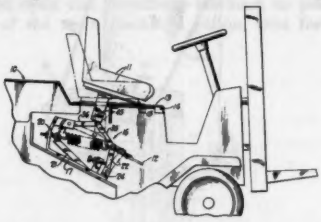
A brake-actuated lever is movable to apply brakes by a hand-operated cable. A spring applies the brakes through a second lever having a pin-engaging first lever. Lost motion between cable and first lever permits movement of first lever by second lever without movement of cable. Second lever moved from first lever by toggle joint shifted towards dead center by weight of operator on seat.

3,664,454

DEADMAN SEAT ACTUATED BRAKE

Samuel H. Cottrell, Mound, Minn., assignor to White Farm Equipment Company

Filed June 5, 1970, Ser. No. 43,854
Int. Cl. B60b 7/12
U.S. Cl. 180—101 19 Claims



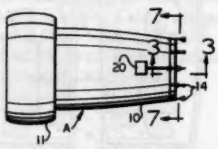
A spring for urging the application brakes of a fork-lift truck is overpowered by a toggle joint moved toward its dead center by depression of the knee thereof by the weight of the operator in the operator's seat. The mechanical advantage provided by the toggle joint between the seat and the brake-applying spring is such that the seat may bounce normally without permitting application of the brake. Further, the seat can be tilted forwardly for access to the truck without additional attention to disconnection and reconnection of parts.

3,664,455

TWISTED VANE SOUND SUPPRESSOR FOR AIRCRAFT JET ENGINE

Tirumalesa Duvvuri, Chula Vista, Calif., assignor to Rohr Corporation, Chula Vista, Calif.

Filed Mar. 15, 1971, Ser. No. 124,366
Int. Cl. F01n 1/14, 1/18; B64d 33/06
U.S. Cl. 181—33 HC 4 Claims



A plurality of vanes, each twisted about a longitudinal axis, and of airfoil sectional shape, are mounted peripherally about the exit end of a jet engine duct from which a jet exhaust stream is discharged. Control means adjust the vanes about their longitudinal axis from stowed position with their leading ends substantially tangent to the edge portion of the duct upon which they are mounted, to deployed position with their leading ends disposed substantially radially of such duct. In their stowed position the vanes cause minimum mixing of the jet stream gases with the surrounding ambient air, while in their deployed position the outer portions of the vanes project into the surrounding ambient air, and their inner portions project into the jet exhaust stream to cause a substantial but smooth intermixing of such gases, thereby tending to reduce noise producing turbulence.

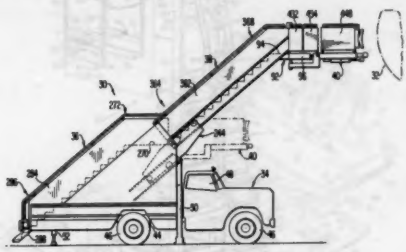
3,664,456

CONVEYANCE SERVICING STRUCTURE

James W. Smith, Sr., Coral Gables; Benjiman E. Evans, Hialeah; William M. Riggles, Jr., Miami Lakes, and Urmas Schormann, Miami, all of Fla., assignors to Wollard Aircraft Equipment, Inc.

Filed July 20, 1970, Ser. No. 56,288
Int. Cl. E06c 5/06
U.S. Cl. 182—62.5 27 Claims

Conveyance servicing structure includes a truck-mounted platform and elevator structure for raising and lowering the platform to various heights for servicing conveyances of various sizes or at various levels. The platform defines a path for traffic to and from the conveyance, and the platform can extend and retract in a direction along the path. The platform can also move bodily in a direction which is lateral to the traffic path, and can also swing upwardly and downwardly. A



bumper on the end of the platform can swing in a direction which is lateral relative to the path. In one embodiment, the elevator structure takes the form of a stair assembly which is extensible and includes a lower section, an upper section, and a carriage for the upper section. The stair assembly can be locked in increments of one riser height. In another embodiment, the elevator structure comprises a scissors lift.

3,664,457

FIRE ESCAPE APPARATUS

James M. York, P.O. Box 176, South Elgin, Ill.

Filed Jan. 11, 1971, Ser. No. 105,360
Int. Cl. A62b 1/20
U.S. Cl. 182—70 8 Claims

A fire escape apparatus including a descending chain or ladder normally concealed within a weatherproof container and retained therein by readily releasable means.

3,664,458

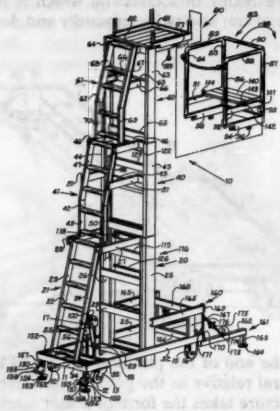
LADDER SCAFFOLD VEHICLE

Lorance E. Sterns, and Arthur G. Howard, both of Indianapolis, Ind., assignors to M. S. Churchman, Inc., Indianapolis, Md. and Keyless Lock Company, Inc., Indianapolis, Ind., part interest to each

Filed Jan. 20, 1971, Ser. No. 108,123
Int. Cl. E06c 5/04, 7/04
U.S. Cl. 182—102 9 Claims

A vehicle having a ladder and a scaffold which may be extended and retracted by a winch and cable arrangement. A main frame mounted on wheels has a sloping ladder fixedly mounted to its top. The ladder is telescopic, having a middle

and top ladder section retractable into a lower ladder section. A first platform is fixedly mounted to the top of the uppermost ladder section. A cage surrounds the platform and is



pivotable downward. A second smaller platform is erectable on the first platform. Adjustable jack assemblies and braces fixed to the main frame are engageable to prevent movement of the vehicle. The braces are retracted when not in use.

3,664,459

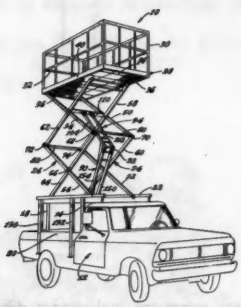
EXTENDABLE SCAFFOLD

James M. Stephens, Long Beach, and Erven Tallman, Los Angeles, both of Calif., assignors to Shur-Lift Trailer & Manufacturing Co., a division of Norco Sales & Manufacturing Co., Sun Valley, Calif.

Filed Aug. 28, 1970, Ser. No. 67,705

Int. Cl. E04g *1/22*

U.S. Cl. 182—141 **9 Claims**



An extendable scaffold mountable to a standard pickup truck body and including a working platform, two scissor linkages, a base and a hydraulic mechanism which combine to allow the working platform to be extended to a maximum height or any intermediate height and yet be collapsed to a very compact position when not in use.

3,664,460

TREE SEAT

Melvin M. Zdrolik, 2060 South 77th Street, Milwaukee, Wis.

Filed Mar. 8, 1971, Ser. No. 121,876

Int. Cl. A47c *9/10*

U.S. Cl. 182—187 **6 Claims**

A collapsible and portable tree seat for hunters, campers, etc. comprises two narrow hinged seat sections suspended from a tree trunk by a sling and a telescoping strut with a curved tip which engages the trunk of a tree to space the seat

from the tree trunk so that the user can comfortably center himself on the seat without touching the tree trunk.

3,664,461

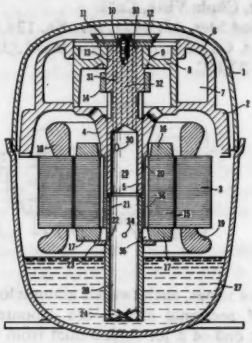
OIL PUMP FOR A MOTOR COMPRESSOR

Hans Ulrik Leffers; Bendt Wegge Romer, both of Augustenborg, and Knud Vagan Valbjorn, Nordborg, all of Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Continuation of application Ser. No. 836,118, June 24, 1969, now abandoned. This application Mar. 31, 1971, Ser. No. 129,994

Int. Cl. F16n *7/18*

U.S. Cl. 184—6.16 **1 Claim**



The invention relates to a lubricating system for a motor compressor assembly. The assembly has an oil sump and the motor compressor unit has vertically extending shaft means with a central lubricating bore, the lower part of the shaft means being disposed in the sump with the mouth of the bore being in fluid communication with the lubricating oil in the sump. The mouth of the shaft bore is provided with a propeller to effect an increased rate of lubricating oil delivery.

3,664,462

LUBRICANT METERING VALVE

William O. Smith, Sr., 2806 Amsterdam Road, Ludlow, Ky.

Filed May 27, 1970, Ser. No. 40,878

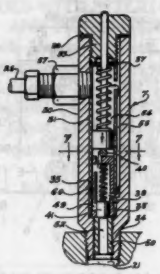
Int. Cl. F16n *23/00*

U.S. Cl. 184—7 D **9 Claims**

A self-contained metering valve for a centralized lubrication system in which the metering valve comprises a valve body having a longitudinal bore, an input passageway leading to one end of the bore, and a normally closed one-way valve assembly comprising a check valve sleeve and spring-biased piston disposed adjacent the input passageway. The bore of

the valve body further includes a spring-biased main discharge piston located above the check piston, together with transfer passageways leading from the one-way valve assembly to the opposite sides of the spring-biased discharge piston.

The arrangement is such that the lubrication system supplies timed surges of high pressure lubricant, forcing the check piston open and permitting lubricant to pass to the lower end of the main discharge piston, thus forcing the



piston upwardly. The bore above the main piston comprises a metering chamber which dispenses a metered quantity of lubricant through an output passageway to a bearing as the piston is forced upwardly. When the pressure in the system drops to zero, then the check piston is closed by its biasing spring, blocking the inlet passageway and opening the transfer passageway to transfer lubricant from the pressure chamber below the piston to the metering chamber above the piston so as to condition the valve for the next cycle.

3,664,463

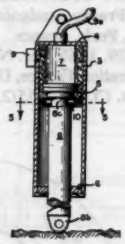
DEPLOYABLE SHOCK ABSORBER

Melvin W. Kuethe, Littleton, Colo., assignor to Martin Marietta Corporation, New York, N.Y.

Filed Nov. 10, 1970, Ser. No. 88,323

Int. Cl. F16f 7/12

U.S. Cl. 188—1 C **11 Claims**



A deployable shock absorber including a cylinder closed at one end and a piston having a latch assembly disposed at the opposite end; a tubular sleeve of crushable shock absorbing material is mounted in the cylinder, coaxially therewith, one end of the sleeve abutting the closed end of the cylinder, and the opposite end of the sleeve abutting the inner face of the piston. A piston rod is slidably mounted within the tubular sleeve, whereby in the retracted position the inner end of the piston rod abuts the closed end of the cylinder; when extended, the inner end of the piston rod becomes latched to the piston, and upon impact, the piston rod and associated piston are driven inwardly toward the closed end of the cylinder to thereby crush the sleeve, whereby the impact shock is absorbed.

3,664,464

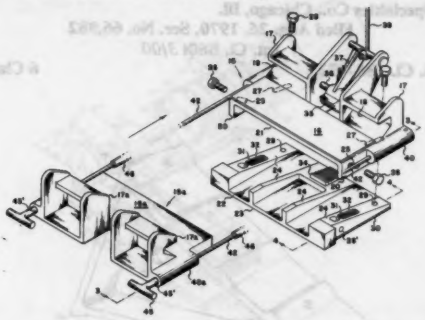
ANTISKID DEVICE

Charles V. Southard, Marietta, Ga., assignor to Lockheed Aircraft Corporation, Burbank, Calif.

Filed June 24, 1970, Ser. No. 49,338

Int. Cl. B60t 1/14

U.S. Cl. 188—5 **6 Claims**



This device attaches to the undersurface of a cargo pallet at the "uphill" side thereof and serves to restrain the palletized load if released as by accident during on and off loading operations of a vehicle. The device consists of a spring-loaded wedge held in a bracket in the retracted position off the adjacent surface during loading by tying a lanyard from the wedge to the tow cable. If the tow cable should fail, tension on the lanyard is automatically released and the spring-loaded wedge moves to the lower position to apply friction against the surface, when the palletized load begins moving by gravity down the incline. The foot of the wedge and the upper portion of the bracket which mates with the undersurface of the pallet are both covered with rubber or the like which serves to increase the frictional coefficient between the wedge and surface to prevent damage to the pallet.

3,664,465

TROLLEYS

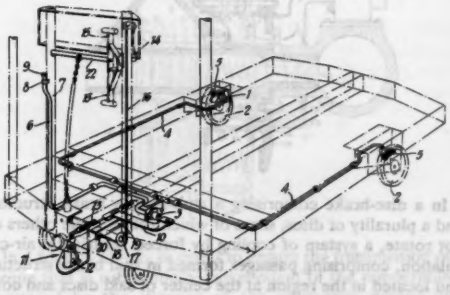
Gordon Christopher Yardley Holland, London, England, assignor to Lansing Bagnall Limited, Basingstoke, Hampshire, England

Filed Feb. 24, 1970, Ser. No. 13,384

Claims priority, application Great Britain, Feb. 24, 1969, 9,853/69

Int. Cl. B62c 5/04

U.S. Cl. 188—10 **3 Claims**



A wheeled trolley provided with an hydraulic braking system for the wheels thereof. The hydraulic braking system according to one aspect has a reservoir comprising a verti-

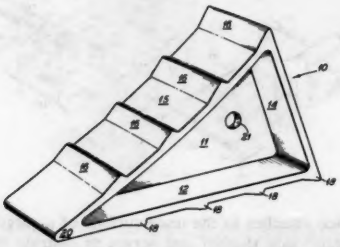
cally extending tube of uniform cross section and according to another aspect has a single master piston and cylinder arranged to be actuated by any one of an over-run device, a squeeze-grip device and a hand-lever device.

3,664,466

WHEEL WEDGE

Jordan I. Rotheiser, Highland Park, Ill., assignor to Central Specialties Co., Chicago, Ill.

Filed Aug. 26, 1970, Ser. No. 66,982
Int. Cl. B60t *3/00*
U.S. Cl. 188—32 **6 Claims**



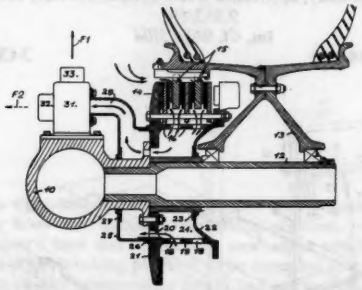
A one piece molded bilaterally symmetrical wheel wedge is disclosed, having a central supporting web, a planar base flange perpendicular to the supporting web, a rear flange intersecting the base flange and at an acute angle therewith, and a concave upwardly facing rim flange which extends at an acute angle from the forward portion of the base flange to the upper portion of the rear flange. A plurality of generally triangular wheel grip wedges extend laterally of the base flange and the ramp flange.

3,664,467

DISC BRAKE COOLING DEVICE

Rene Lucien, Neuilly-sur-Seine, and Jean Masclet, Paris, both of France, assignors to Meisser, Paris, France

Filed Aug. 4, 1969, Ser. No. 847,325
Claims priority, application France, Aug. 7, 1968, 162243
Int. Cl. F16d *65/84*
U.S. Cl. 188—71.6 **4 Claims**



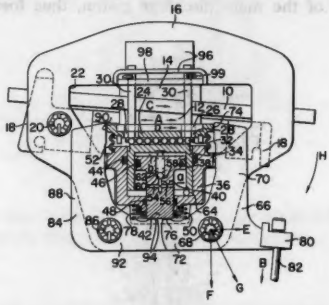
In a disc-brake comprising a stub-axle, a brake structure and a plurality of discs, some of which rotate while others do not rotate, a system of cooling by forced centripetal air-circulation, comprising passages formed in said brake structure and located in the region at the center of said discs and communicating in said region with the external air passing between said discs, an annular conduit mounted on said brake structure and adapted to communicate with said passages, an air-suction means mounted on said stub-axle and adapted to suck the air from said annular conduit.

3,664,468

SELF FORCE-INCREASING DISK BRAKE

Hiroyuki Oka, Toyota-shi, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi-ken, Japan

Filed Jan. 5, 1970, Ser. No. 655
Int. Cl. F16d *55/48*
U.S. Cl. 188—72.2 **18 Claims**



A disk brake is provided with means for intensifying the braking pressure. A friction member for engagement with a side of a rotary disk is fixed to a plate which is mounted at the front end of piston means for movement therewith and in a lateral direction. A pivoted lever is related to the plate so that one arm of the lever is cooperable with a side of the plate and a second arm is cooperable with the rear end of the piston means. When the piston means is actuated to cause engagement of the friction member with the side of the rotating disk, the friction member, which is moved laterally by virtue of its frictional engagement with the rotating disk, carries the plate with it and causes the plate to engage and rotate the lever, thereby causing the lever to exert an increased braking pressure upon the piston means and its associated friction member.

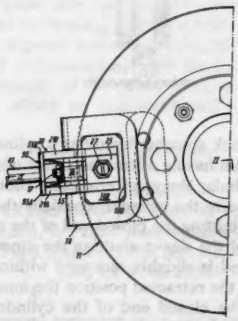
Also, means is provided to compensate for the wear of the friction member or members; and the means is provided for maintaining the brake in engaged or parked condition.

3,664,469

MECHANICALLY-OPERATED DISC-BRAKE

Jean Maurice, Paris, France, assignor to Societe Anonyme Francaise du Ferodo, Paris, France

Filed Dec. 29, 1969, Ser. No. 888,355
Claims priority, application France, Dec. 31, 1968, 812404
Int. Cl. F16d *55/224*
U.S. Cl. 188—72.9 **4 Claims**



A mechanically operated disc-brake of the kind comprising a disc fast for rotation with the member to be braked, a fixed support, two brake shoes disposed one on each side of said disc and slidably mounted in housings formed in said fixed

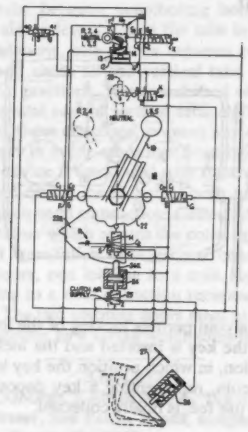
support, an operating lever adapted to co-operate with one of said shoes through a cam surface, and a transfer member on which said lever is articulated and which transmits to the second said shoe the braking action applied by said operating lever on the first shoe, in which said transfer member is coupled to the fixed support of the brake by an elastic blade which permits a rocking movement of said member with respect to said fixed support.

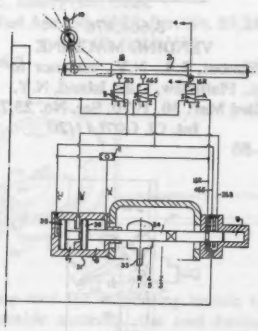
3,664,470

FLUID CONTROLS WITH INTERLOCK FOR CLUTCH AND TRANSMISSION

Austin Sidney Beech, Harpenden, and Roy Burrows, Wolverton, both of England, assignors to Austin S. Beech & Company Limited-Energy Works, Leighton Buzzard, Bedfordshire, England

Filed July 1, 1970, Ser. No. 51,559
Claims priority, application Great Britain, July 24, 1969, 37,366/69
Int. Cl. B60k *21/00*
U.S. Cl. 192—3.57 **14 Claims**





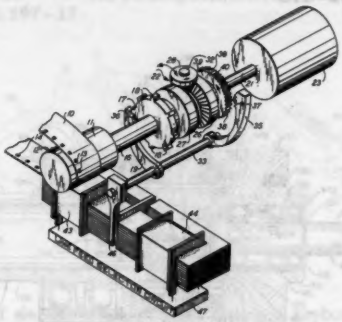
A pressure fluid operated control system incorporates an actuator member movable in a first direction along a path from which, at predetermined positions on the path, the actuator is movable into and out of operative positions in a second, transverse, direction. The invention provides first and second fluid actuator means for displacing the member in the two directions and incorporates, in controlling valve means for the actuator means, two interlock valves each of which is responsive to the operation of one of the fluid actuators and is connected in the supply to the other whereby each fluid actuator can only be operated if the other is correctly positioned.

3,664,471

SELECTIVE DRIVE MECHANISMS

Raymond R. Seidlitz, Rolling Meadows, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed Aug. 7, 1970, Ser. No. 61,882
Int. Cl. F16d *67/00*, *71/00*
U.S. Cl. 192—4 R **6 Claims**



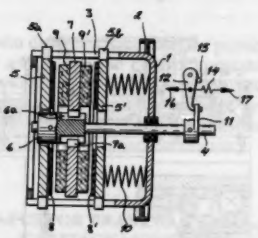
An intermittent motion transmitting device wherein the output of a continually rotating shaft is transferred selectively through an epicyclic gear train to advance a driven member. In one instance, the epicyclic gear train has associated therewith an input shaft attached to a constant speed motor and an output shaft attached to a platen of a printer. A plurality of spaced cogs project from the output shaft and are singularly engaged by a first stop lever to insure precise line feed spacing and to prevent rotation of the platen while the printer is printing. Upon engaging a ratchet wheel controller with a second stop lever, the rotation of the input shaft is transmitted through the epicyclic gear train to the platen. When the second stop lever engages the ratchet wheel, the first stop lever disengages from a cog on the output shaft to release the platen for positive rotation by the motor through increments corresponding to one or more line feed operations.

3,664,472

COUPLING WITH THERMOPLASTIC AND CELLULOSIC FRICTION DISC

Karl Martini; Peter Forster; Dieter Bierbaum, and Gunther Halm, Karl-Marx-Stadt, all of Germany, assignors to Kombinat VEB Messgeratewerk Zwonitz, Zwonitz, Germany

Filed Dec. 10, 1969, Ser. No. 883,834
Int. Cl. F16d *67/02*, *69/02*
U.S. Cl. 192—12 R **11 Claims**



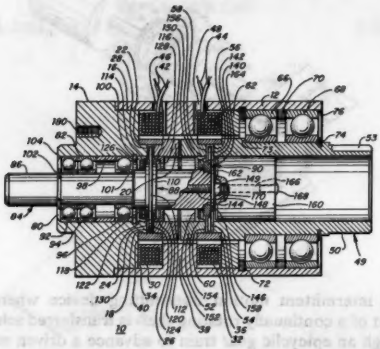
In a friction clutch, in order to ensure the transmission of a torque that is substantially independent of the temperatures generated by the slippage of the contacting driving and driven friction elements urged into engagement by spring means, the work face of one friction element is a thermoplastic material, such as Teflon, while the work face of the other friction element is cork.

3,664,473

COMBINATION MAGNETIC PARTICLE CLUTCH AND BRAKE ASSEMBLY

James R. Hendershot, Jr., and Robert F. Searle, Amherst, both of N.H., assignors to Vibrac Corporation, Chelmsford, Mass.

Filed July 9, 1970, Ser. No. 53,651
Int. Cl. F16d 27/00
U.S. Cl. 192—21.5 11 Claims



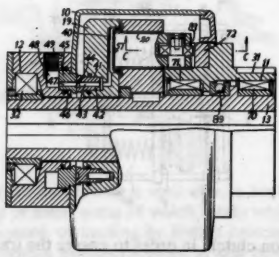
A combination magnetic particle clutch and brake device and a method of assembling the same which comprises a single output shaft having a pair of spaced discs mounted thereon, with one disc used as part of a brake unit and the other disc used as part of a clutch unit. Brake and clutch driver coils are provided for energizing each of the units. Bearing assemblies are provided at opposite ends of the device to rotatably support the output shaft and an input rotor pole which is part of the clutch unit. The device is designed so as to facilitate assembly and to maintain very close tolerances in spacing of the parts without need for shimming.

3,664,474

TORQUE TRANSMITTING DEVICES

John Berchmans Blake, Preston, and Roger Anderton Ashworth, Clitheroe, both of England, assignors to Allspeeds Holdings Limited, Accrington, Lancashire, England

Filed Feb. 18, 1970, Ser. No. 12,383
Claims priority, application Great Britain, Feb. 18, 1969, 8,807/69
Int. Cl. F16d 43/20, 31/02
U.S. Cl. 192—56 F 10 Claims



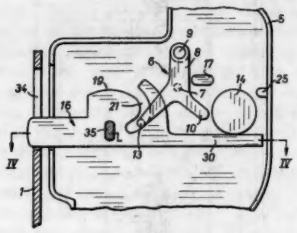
A torque transmission device consists of a resilient coupling between two shafts. The resilient coupling comprises an assembly mounted on one shaft and provided with a plurality of cylinders each having a piston and a cam arrangement mounted on the other shaft and controlling the piston as regards movement in their respective cylinders upon angular displacement between the two shafts under load conditions. A fluid-filled passage connects the cylinder heads with an outlet for indication or control purposes. The cylinders may be arranged radially with respect to the shaft axes or parallel thereto. A suitable indicating instrument may be connected to the outlet for torque sensing and the device may also be used for torque limiting by connecting to the outlet, means, for instance a metallic bellows, which, at a predetermined value of fluid pressure, increase the volume occupied by the fluid. In addition, the device may be used as a fluid clutch by the provision of manually-operated means for increasing the volume occupied by the fluid.

3,664,475

COIN CONTROLLED LOCKING DEVICE WITH COIN HOLDING MEANS

Evaristo Koch, Gallen, Switzerland, assignor to Kilian Schwizer, Gassau, Switzerland

Filed Aug. 10, 1970, Ser. No. 62,529
Claims priority, application Switzerland, Aug. 21, 1969, 12677/69; Oct. 24, 1969, 15892/69
Int. Cl. G07f 5/26
U.S. Cl. 194—51 8 Claims



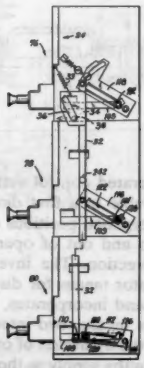
Insertion of a coin permits locking of the lock. The coin is retained until the key is inserted and the lock is turned into the open position, in which position the key is secured in the lock and the coin, representing a key deposit returned, or, representing a use fee, is finally collected.

3,664,476

VENDING MACHINE

Guy Mauro, Elmont, L.I., N.Y., assignor to Transvac Electronics Corp., Plainview, Long Island, N.Y.

Filed Mar. 30, 1970, Ser. No. 23,782
Int. Cl. G07f 11/20
U.S. Cl. 194—58 24 Claims



A mechanical vending machine including: a coinage totalizer, comprising a rotatable counting wheel having a notch

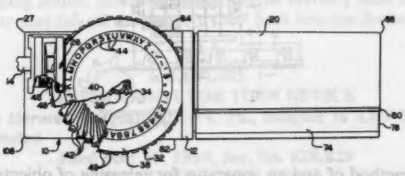
therein, which notch moves opposite a latch release post upon required coinage being deposited in the vending machine. A coin lockout slide, which is released by movement of the latch release post into the counting wheel notch, has a cam follower connected to it. The cam follower rides along a cam comprised of a slot which is oblique and transverse to both the slide and a vending machine lockout release means post. The cam is secured to the lockout release means post. That post has pivotally secured to it guide means having slots therein for receiving and directing the movement of merchandise release lever guide bars. Upon operation of a merchandise release lever, a guide bar therefor slides through the guide means slot and pivots the guide means to a release position. This axially shifts the lockout release means post, which correspondingly moves the cam, which, in turn, moves the cam follower and slides the slide. If the slide is not unlatched, the guide means cannot pivot and release of merchandise is precluded. Each merchandise release lever has a wedge element connected to it, which moves with the lever. A row of tabs is aligned next to the row of merchandise release levers. Upon operation of one of these levers, its wedge moves between neighboring tabs, causes the tabs in the row to separate and enables the tabs to block operation of other merchandise release levers in the row. There are also vertical tabs between neighboring horizontal rows of merchandise release levers. Upon the tabs in one horizontal row shifting sideways, one moves between two neighboring vertical tabs and shifts all the vertical tabs vertically away from their initial positions. The now shifted vertical tabs contact each horizontal row of vertical tabs, shift the horizontal tabs of each of those rows and prevent any other merchandise release lever in every other row from being operated. A recycling cam device is associated with the totalizer and with the coin lockout device for recycling both back to the start position after each vend transaction. Collected coins travel to an escrow container which retains the coins until the completion of a vend transaction. The escrow container includes two pivoting doors, one leading to a coin return chute and the other leading to a coin collection receptacle upon vending of an item. The two pivoting doors meet at their free ends and are held together by a spring which joins them.

3,664,477

COMPACT EMBOSSING TOOL

Georg Fritz Bermer, Sao Paulo, Brazil, assignor to Dymo Industries, Inc., Emeryville, Calif.

Filed Apr. 30, 1970, Ser. No. 33,250
Int. Cl. B41j *1/30*
U.S. Cl. 197—6.7 **14 Claims**



An embossing tool for embossing indicia in an elongate strip of embossable material, the tool having a generally rectangular frame, an embossing station adjacent a first corner of the frame, embossing means at the embossing station, an actuating lever pivoted at one end thereof adjacent a diagonally opposite second corner of the frame, a supply of strip material held adjacent a third corner, and a link pivoted at one end thereof adjacent a fourth corner of the frame diagonally opposite the third corner, the lever and link being arranged end-to-end in general alignment between the second and fourth corners and coupled at juxtaposed ends thereof such that upon depression of the actuating lever by an actuating force applied thereto adjacent the juxtaposed ends, the link will be pivoted laterally to operate actuating means for actuating the embossing means at the embossing station.

3,664,478

MUTUAL LOCKING DEVICE FOR AN OFFICE MACHINE WITH ELECTRIC KEYBOARD

Adriano Menicanti, Ivrea, and Giacomo Oberto, Samore, both of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Torino, Italy

Filed Sept. 2, 1970, Ser. No. 68,820
Claims priority, application Italy, Sept. 16, 1969, 53351 A/69
Int. Cl. B41j *23/08, 5/22*
U.S. Cl. 197—17 **10 Claims**

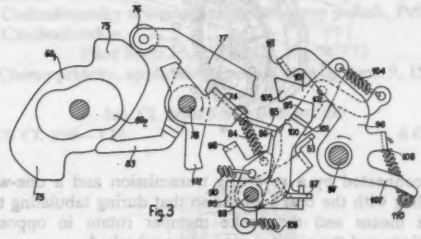


Fig. 3

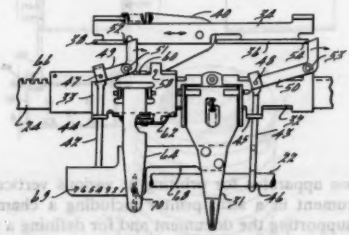
In an electric office machine having a keyboard and a cyclic operating mechanism responsive to the keyboard, locking means for preventing the mechanism from operating if two keys are depressed simultaneously until such time as the locking means are released by a motor-driven releasing means consisting of an oscillating member and a release element arranged to be operated by the oscillating member when a release key is depressed.

3,664,479

MARGIN CONTROL APPARATUS WITH VARIABLE LENGTH MARGIN ZONE

Farouk D. Arjani, San Mateo, Calif.; Kenneth C. Campbell, Greeley, and Craig B. Smeins, Longmont, both of Colo., assignors to Intercontinental Systems, Inc., Palo Alto, Calif.

Filed Feb. 2, 1970, Ser. No. 7,507
Int. Cl. B41j *21/02*
U.S. Cl. 197—63 **7 Claims**



There is herein disclosed apparatus for providing a variable length margin zone in margin control apparatus comprising, in one form, variable positionable switch actuating means operably associated with a printer carriage and, in another form, adjustable electronic counter means associated with printer and margin control apparatus circuitry.

3,664,480

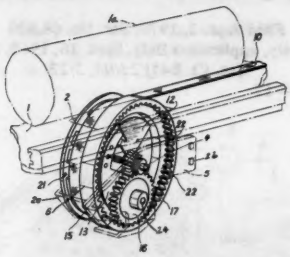
APPARATUS FOR BRAKING A TABULATING CARRIAGE MOVEMENT

Helmut Helmers, Wilhelmshv.; Georg Werner, Heidmuehle, and Albert Rix, Wilhelmshv, all of Germany, assignors to Olympia Werka AG, Wilhelmshaven, Germany

Filed Nov. 20, 1969, Ser. No. 878,372
Claims priority, application Germany, Nov. 29, 1968, P 18 11 758.3
Int. Cl. B41j *19/02*
U.S. Cl. 197—64 **10 Claims**

The drive member of a spring motor, which is connected

with a typewriter carriage for moving the same in a writing and tabulating direction, is mounted for rotation about the same axis as a centrifugal brake means which is surrounded by an annular brake member integral with the drive member



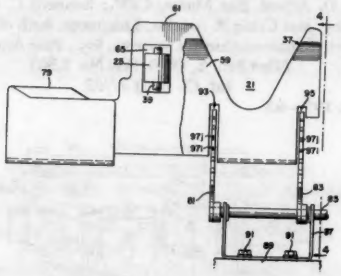
and connected by a reversing transmission and a one-way coupling with the brake means so that during tabulating the brake means and the brake member rotate in opposite directions and the carriage movement is braked.

3,664,481

DOCUMENT ELEVATION APPARATUS FOR A STRIP PRINTER

Herbert V. Dreimanis, Southfield; Albert S. Spisz, Livonia; Eugene L. Merlino, Jr., Dearborn, and Jonas Ellis, Birmingham, all of Mich., assignors to Burroughs Corporation, Detroit, Mich.

Filed Mar. 16, 1970, Ser. No. 19,633
Int. Cl. B41j *15/00*
U.S. Cl. 197—133 R **8 Claims**



Elevation apparatus for printing at various vertical levels on a document in a strip printer including a chamber for laterally supporting the document and for defining a printing area, a front edge stop for indexing the leading edge of the document and an elevation mechanism for adjusting the vertical position of the document. The elevation mechanism includes a plurality of rotatable cams on a common shaft; the cams having like series of steps or shoulders to support the bottom edge of the document at different heights.

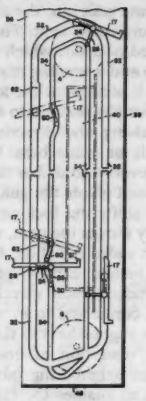
3,664,482

VERTICAL CHAIN TYPE CONVEYOR WITH TILTING SHELVES

Andrew T. Kornylak, 400 Heaton Street, Hamilton, Ohio

Filed Apr. 24, 1970, Ser. No. 31,602
Int. Cl. B65g *47/00*
U.S. Cl. 198—20 **5 Claims**

A conveyor for transporting loads between vertically spaced stations. A plurality of shelves are pivotally connected to a pair of chains which are power driven to carry the shelves to the stations. The shelves are tilted at the unloading station for gravity discharge of the load from the front and are tilted in the opposite direction at the loading station to slide the load toward the rear to prevent escape from the



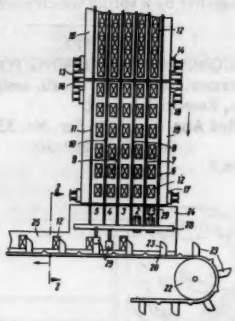
front during transport. Guide devices are provided at the tilting axis to prevent deflection of the chain by the tilting forces.

3,664,483

METHOD OF AND APPARATUS FOR RELEASING OBJECTS TO A TRANSPORTING DEVICE

Leon Revaz, Bienne, Switzerland, assignor to Otto Hansel GmbH, Hannover, Germany

Filed Mar. 12, 1970, Ser. No. 19,010
Claims priority, application Switzerland, Mar. 14, 1969, 3855/69
Int. Cl. B65g *47/26*
U.S. Cl. 198—32 **11 Claims**



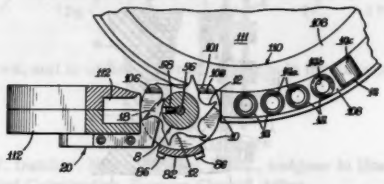
A method of and an apparatus for releasing of objects fed in a plurality of adjacent feeding channels to a transportation device with a feeding member passing in front of the terminal of the feeding channels, on which feeding member the objects are transferred to the latter in one row in series, which comprises the steps of releasing an object to the feeding member successively from each feeding channel terminal, starting with the last of the feeding channels seen in the direction of movement of the feeding channels. The feeding member is then advanced for a predetermined length from the movement of reception of an object from a feeding channel up to the moment of reception from an adjacent feeding channel. Finally, the transmission, after release of an object from the first feeding channel, of any further series of objects to the feeding member, until the object received from the first channel of the feeding member has passed the terminal of the last of the feeding channels is omitted.

3,664,484

ORIENTING WORKPIECES

Clifford A. Haumiller, 960 East Chicago Street, Elgin, Ill.

Filed Oct. 2, 1970, Ser. No. 77,529
Int. Cl. B65g 47/24
U.S. Cl. 198—33 AA 9 Claims



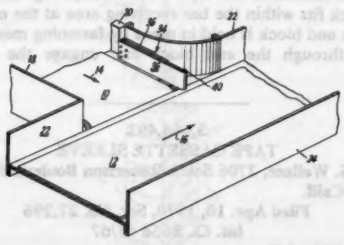
A conventional device for continuously delivering sleeves is arranged to deliver them to a delivery station or shelf of an orienter. The sleeves are delivered randomly on their sides or with their thin-section ends upwardly or with their thick-section ends upwardly, and the orienter comprises a rotor which during normal operation of the system rotates continuously and comprises a plurality of spaced arcuate fingers defining recesses complementary to the outside diameters of the sleeves and adapted to receive the same as they are delivered to the delivery station. The rotor comprises a plurality of independent clamps above respective recesses, each clamp having a moveable jaw adapted to automatically enter the thin-section end of a sleeve and clamp it against the rotor until the clamped sleeve passes over a delivery station or shelf whereupon the moveable jaw is automatically withdrawn from the sleeve, and the finger engaged therewith squeezes the sleeve against a stationary pick-off cam or finger to urge the sleeve, with its thin-section up, into a chute. If a sleeve is delivered, on its side or with its thick-section end up, to the delivery shelf the moveable jaw cannot enter the sleeve and as the moveable jaw moves downwardly it ejects the sleeve through a gap between the shelves downwardly into the feeder which redelivers the sleeve to the delivery shelf. If the chute, for any reason, fails to be emptied as fast as sleeves are delivered to the chute by the rotor, the jamming action of the last sleeve in the chute with a sleeve carried by the rotor causes the rotor to stop rotating, and a slip clutch is provided so that the rotor motor may continue to operate until the chute is open to receive one or more sleeves whereupon the rotor again rotates until the chute is again filled. While the rotor is stopped during such a jamming action, sleeves delivered to the delivery shelf by the feeder may fall off the delivery shelf back into the feeder.

3,664,485

INTER-CONVEYOR TURN DEVICE

John Herman Langenhop, York, Pa., assignor to AMF Incorporated

Filed May 29, 1969, Ser. No. 828,829
Int. Cl. B65g 47/52, 37/00
U.S. Cl. 198—78 1 Claim



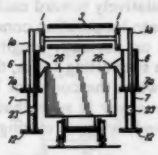
Materials handling apparatus which comprises a first conveyor belt, a second conveyor belt disposed to receive articles from said first conveyor belt, the direction of movement of said second belt being perpendicular to the first, and means mounted adjacent said conveyor belts for assisting articles around the ninety-degree turn from the first conveyor to the second conveyor.

3,664,486

LIFTING PROP FOR A TRANSFER CONVEYOR

Vladimir Mares, Pribram, Czechoslovakia, assignor to Ceskoslovensky uranovy prumysl oborovy podnik, Pribram, Czechoslovakia

Filed Sept. 23, 1970, Ser. No. 74,772
Claims priority, application Czechoslovakia, Sept. 9, 1969, 6754-69
Int. Cl. B60s 9/02; B65g 41/00
U.S. Cl. 198—126 4 Claims



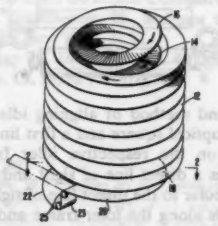
A lifting prop for a transfer conveyor enabling its displacement in gangways of mines and in tunnels. The prop is composed of a number of mutually vertically adjustable systems controlled by a pressure medium, enabling the conveyor to be seated on mine cars lifted above said cars, resting by means of said props on the ground, said props adapted to compensate any unevenness of the ground.

3,664,487

ENDLESS HELICAL CONVEYER AND BELT

Carl H. Ballenger, 1751 Circle Road, Ruxton, Md.

Filed May 23, 1969, Ser. No. 827,381
Int. Cl. B65g 17/06
U.S. Cl. 198—136 18 Claims



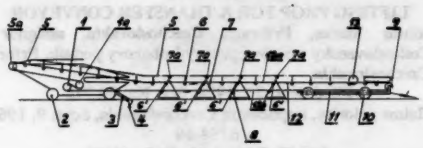
An endless conveyor having an endless flat link belt driven in two concentric helical paths by concentric rotary drums which engage the inner edges of the belt inwardly of the two helical paths to push the belt upwardly along one path crossing over at the top and downwardly along the other path. The belt links along the inner edge of the belt are collapsible to enable the belt to assume different curvatures while the links along the outer edge of the belt have a greater longitudinal dimension to accommodate the greater radius of curvature along the outer edge of the belt. Because the belt is driven along its inner edge and moves in a helical path, each link is pivoted about the inner edge in the forward direction of conveyance thus placing the outer edge of the belt under tension at all times during operation.

3,664,488

COLLAPSIBLE BELT CONVEYOR

Jaroslav Florian, Kralupy N. Vltavou, and Ladislav Binovec, Prague, both of Czechoslovakia, assignors to Vyzkumny ustav pozemnick staveb

Filed Nov. 25, 1969, Ser. No. 879,814
Int. Cl. B65g 15/26
U.S. Cl. 198—139 1 Claim



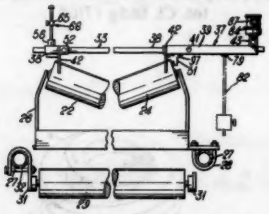
A readily collapsible belt conveyor wherein the ends of the belt are carried and driven at spaced abutment supports which are moved relatively toward each other when the conveyor is collapsed into inoperation condition. The runs of the belt are supported on normally longitudinally spaced roller stands, mounted on supporting ropes, the stands being movable close together when the conveyor is collapsed. The construction of the conveyor is such that it may be collapsed, and moved if desired, without cutting or disconnecting the belt.

3,664,489

APPARATUS AND METHOD FOR ALIGNING BELT CONVEYOR COMPONENTS SUCH AS IDLER FRAMES AND PULLEYS

Walter Francis Henry Krauss, 66 The Boulevard, Ivanhoe, Victoria, Australia, and Norman Ernest Westmore, deceased, late of 31 Third Street, Black Rock, Victoria, Australia (by Anna Mira Westmore, executrix)

Filed Jan. 27, 1971, Ser. No. 110,239
Int. Cl. B65g 13/11
U.S. Cl. 198—192 12 Claims



Apparatus and method of aligning idler frames of a belt conveyor. An optical square and a first line of sight indicator are mounted on the respective idler frame. The optical square provides a direct line of sight and an indirect line of sight perpendicular to the direct line of sight. One of the lines of sight extends along the idler frame and the other extends along the conveyor. A second line of sight indicator is located at a position along the conveyor from the idler frame and is displaced from the center line of the conveyor to the same extent as the optical square. The two sight indicators are then viewed through the optical square and the idler frame moved to bring them into apparent alignment.

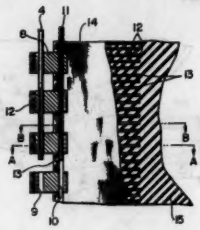
3,664,490

JOINT REINFORCED CONVEYOR BELT

Hideyo Maruyama, Yokohama, Japan, assignor to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Sept. 12, 1969, Ser. No. 857,433
Claims priority, application Japan, Sept. 30, 1968, 43/84138
Int. Cl. B65g 15/30
U.S. Cl. 198—193 4 Claims

Joint reinforced conveyor belt comprising a conveyor belt including a rubber cover and a belt core embedded therein and formed at each end with recesses and projections to be engaged with corresponding projections and recesses of another conveyor belt. Each projection has embedded therein a doubled holed link having two holes at each end. Extending through one of the holes is a joint rod, while extended through the other hole is a spindle. Cords are wound around the spindle end of all of the double holed links and extended in a lengthwise direction of the conveyor belt and embedded in the rubber cover and serve to transmit uniformly the tension applied to the belt core of the conveyor belt all over the width of the belt conveyor.

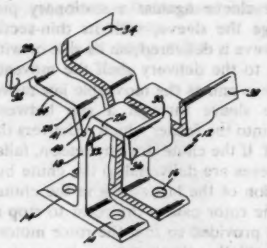


3,664,491

CONVEYOR SLAT CONSTRUCTION

Robert M. Scanlon, Grand Rapids, Mich., and Hildreth C. Beckwith, Monett, Mo., assignors to Granco Equipment, Inc., Grand Rapids, Mich.

Filed June 11, 1970, Ser. No. 45,318
Int. Cl. B65g 15/30
U.S. Cl. 198—195 11 Claims



This disclosure relates to a conveyor slat construction formed of a heat resistant bar and a support structure therefor. The support structure is formed in one piece from an extruded profile. A central portion of the support structure forms a V groove at the top. A bar receiving area is formed from outwardly extending flanges and upwardly extending flanges at the top of the V groove. The sides of the V-shaped groove are biased inwardly thereby compressing the upwardly extending flanges against the bar in the receiving area. A circular notch is formed at the bottom of the V-shaped groove to maintain resiliency within the V-shaped portion. In one embodiment a nut receiving and retaining means is formed at the top of the V-shaped groove and an end block fits within the bar receiving area at the end of the bar. The end block is held in place by fastening means which extend through the end block and engage the retaining means.

3,664,492

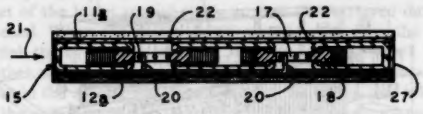
TAPE CASSETTE SLEEVE

Robert S. Wallace, 2706 South Robertson Boulevard, Los Angeles, Calif.

Filed Apr. 10, 1970, Ser. No. 27,296
Int. Cl. B65d 85/67
U.S. Cl. 206—1 R 9 Claims

The invention concerns a sleeve to receive insertion of a cassette case endwise of the sleeve, there being retainer

means on the sleeve to flex as the cassette is inserted or withdrawn, and to unflex into reel openings in the cassette.

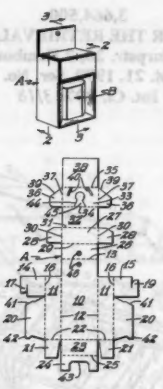


3,664,493

DISPLAY CARTON

Daniel P. Dutcher, North St. Paul, Minn., assignor to Hoerner Waldorf Corporation, Ramsey County, Minn.

Filed Oct. 21, 1970, Ser. No. 82,731
Int. Cl. B65d 5/50
U.S. Cl. 206—45.14 11 Claims



A display carton is provided having an opening in its front panel spaced from the top thereof. The rear wall extends above the level of the carton body to provide a display and a carton support. Liner panels are hinged to the carton at the edges of the opening and converge toward the rear carton wall to encircle the product.

3,664,494

SHIPPING AND DISPLAY CONTAINERS

Gerald R. Mergens, St. Paul, Minn., assignor to Reynolds Guyer, Inc., Minneapolis, Minn.

Filed Nov. 21, 1969, Ser. No. 878,782
Int. Cl. B65d 5/52
U.S. Cl. 206—44 10 Claims

A series of open topped display trays are filled with a plurality of packages of a product, the packages terminating in a common plane parallel to the bottoms of the trays. The trays are stacked in superimposed relation in a tubular container having top and bottom closures. A removable tear strip encircles the container near to and spaced from, the lower closure. The area of the container walls above the tear strip is creased so that this area may be folded inwardly and upwardly after the tear strip has been removed to provide a display stand upon which the display trays may be stacked.

3,664,495

LOCKING CAPSULE

Richard J. Graham, Grosse Pointe; Ralph E. Mottin, Grosse Pointe Park, and Oscar B. Noren, Grosse Pointe Farms, all of Mich., assignors to Parke Davis & Company, Detroit, Mich.

Filed Dec. 21, 1970, Ser. No. 100,303
Int. Cl. A61b 19/02
U.S. Cl. 206—63.2 R 1 Claim

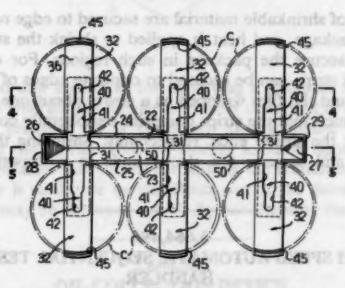
An economical locking capsule is provided having telescopically joinable cap and body parts adapted to be joined together in a prelocking position and optionally in a more fully joined position. The capsule, for packaging of medicaments and the like, is produced by the dip-molding technic on conventional automatic machinery and can be printed, filled, etc., using standard equipment.

3,664,496

CARRIER AND CAN OPENER COMBINATION

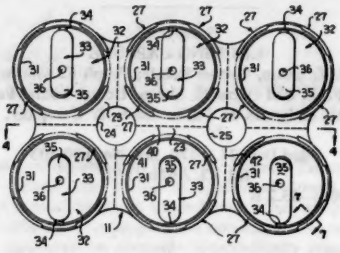
Carmen T. Mascia, Westchester, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Filed May 28, 1970, Ser. No. 41,303
Int. Cl. B65d 17/00, 85/62
U.S. Cl. 206—65 C 16 Claims



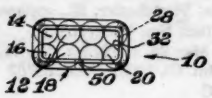
This disclosure relates to a package formed by a carrier to which is secured a plurality of containers having ends provided with tear-out portions, the carrier having a plurality of hollow arms, and each arm having a channel for receiving the rivet of each tear-out portion whereby the removal of each can from the carrier automatically removes the associated tear-out portion.

3,664,497
COMBINED CARRIER AND CAN OPENER
Carmen T. Mascia, Westchester, Ill., assignor to Continental Can Company, Inc., New York, N.Y.
Filed June 16, 1970, Ser. No. 46,656
Int. Cl. B65d 17/00, 85/62
U.S. Cl. 206—65 C 16 Claims



This disclosure relates to a carrier and a plurality of containers having ends provided with tear-out portions, the carrier being constructed as a one-piece molded member having a plurality of openings in each of which is adapted to be disposed a container end, and each opening having a pull tab projecting radially therein and being secured to an associated container end whereby upon grasping the pull tab and pivoting the same in an appropriate manner the tear-out portions can be removed in the absence of conventional pull tabs or similar opening means.

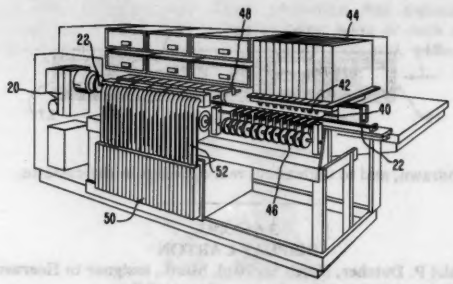
3,664,498
PACKAGE INCLUDING ENVELOPE WITH HEAT-SHRUNK BAND
Fred C. Dulmage, Findlay, Ohio, assignor to The Dow Chemical Company, Midland, Mich.
Filed Sept. 26, 1969, Ser. No. 861,325
Int. Cl. B65d 71/00, 65/16
U.S. Cl. 206—65 S 7 Claims



Strips of shrinkable material are secured to edge regions of a film package, and heat is applied to shrink the strips and thereby secure the package in such regions. For example, two such strips can be secured to opposite edges of a length of film, and the film wrapped as a sleeve about one or more articles such that the strips comprise peripherally continuous bands at the sleeve ends, respectively. Shrinking the bands gathers and secures the sleeve ends in a drawstring-like fashion.

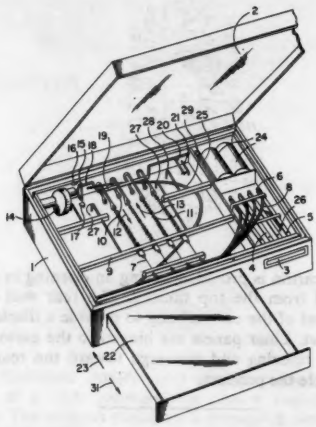
3,664,499
HIGH SPEED AUTOMATIC SEQUENTIAL TESTER-HANDLER
Vahak K. Sahakian, Santa Clara, Calif., assignor to Fairchild Camera and Instrument Corporation, Mountain View, Calif.
Filed Nov. 6, 1970, Ser. No. 87,389
Int. Cl. B07c 5/344
U.S. Cl. 209—73 8 Claims

A high-speed, high-accuracy, automatic sequential tester-handler that under control of a computer receives, tests and



sorts semiconductor devices into separate groups according to their electrical characteristics.

3,664,500
DEVICE FOR THE RETRIEVAL OF DATA
Klaus H. Krebs, Tesdorpstr. 20, 2 Hamburg 13, Germany
Filed Sept. 21, 1970, Ser. No. 73,788
Int. Cl. B07c 3/18
U.S. Cl. 209—80.5 22 Claims



A data retrieval device, operable to retrieve a datum responsive to insertion of a datum selecting card into a data containing unit, has a drawer containing a stack of data sheets each having a different respective recess in an edge thereof. A number of selecting cards, equal to the number of sheets in the stack, are provided, and each card has a sheet releasing characteristic, such as an aperture, a projection, or recess, at a location respective to a different one of the data sheets. When a card is inserted into the unit, its releasing characteristic is engaged by a tension member in accordance with the lateral location of the characteristic, and the tension member is pulled along with the card through a distance corresponding to the spacing of the characteristic from the leading edge of the card. The tension member pulls a connected downturned hook toward the stack of sheets to engage all of the sheet edge recesses aligned with the hook, the hook being drawn to a recess corresponding to the distance of the characteristic from the leading edge of the card. When the card is fully inserted, it closes a switch to energize a motor rotating a crank which lifts all the hooks, with the drawn hook dividing the stack of sheets into two partial stacks. The lower partial stack remains in the drawer and the upper partial stack is engaged with latching pins entering holes in the

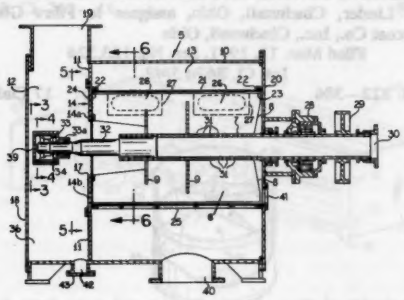
sheets. Upon further rotation of the crank, a detent is released providing for a spring to project the drawer with the lower partial stack of sheets. The selected sheet is the top sheet of the lower partial stack, so that the retrieved data is exposed. When the drawer is reinserted in the unit, the two partial stacks are recombined into the original stack and another switch is operated to actuate the motor to rotate the crank in the reverse direction lowering the hooks, and releasing the detent to engage the drawer. The hooks are retracted by associated springs. In addition to, or in place of, the retrieved data being presented visually, it may be presented audibly by a tape recorder connected to the unit.

3,664,501

PULP SCREENING MACHINE

Ben Cowan, 5460 Connaught Avenue, Montreal 29, Quebec, Canada

Filed Jan. 19, 1970, Ser. No. 3,963
Claims priority, application Canada, Nov. 21, 1969, 068114
Int. Cl. B07b *1/20*
U.S. Cl. 209—273 **8 Claims**



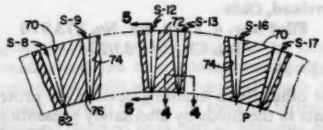
A pulp screening machine of the rotary type for either horizontal or vertical installation of either the open or pressure type in which the screen is made in sectors, joined together and one end place and a sector shaped screen supporting keeper plate and removed whereby the sectors of the screen plate can be removed axially of the machine without disturbing the screen housing in the line or the mounting of the impeller in the machine.

3,664,502

SLURRY SCREEN AND PROCESS OF MAKING IT

George E. Nichols, Jr., Norfolk, Mass., assignor to Bird Machine Company, South Walpole, Mass.

Filed June 26, 1970, Ser. No. 50,136
Int. Cl. B07b *1/18*
U.S. Cl. 209—397 **5 Claims**



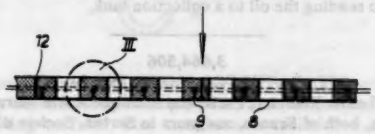
A slotted screen for slurry is produced by Electrical-Discharge Machining the slots in groups in a tubular screen plate. The slots have concave arcuate ends and smoothly curved junctures between walls, being characterized by an absence of sharp indented corners which have been a major cause of cracks and breakage in prior screens.

3,664,503

ELASTIC SIEVE BOTTOM

Alois Felden, Munich, Germany, assignor to Stahlgruber Otto Gruber & Co., Munich, Germany

Filed Aug. 22, 1969, Ser. No. 852,215
Claims priority, application Germany, Aug. 22, 1968, P 17 58 860.2
Int. Cl. B07b *1/46*
U.S. Cl. 209—397 **6 Claims**



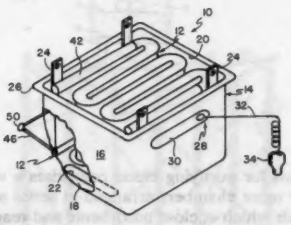
An elastic sieve bottom includes abutting elastic sieve bottom sections with spaced sieve apertures therethrough, and a reinforcing mesh received in grooves in portions of the sieve bottom between the apertures.

3,664,504

METHOD AND APPARATUS FOR DEPLOYING A FLOATABLE BARRIER

Ray R. Ayers; Paul E. Titus, both of Houston, Tex., and James R. Hanson, Martinez, Calif., assignors to Shell Oil Company, New York, N.Y.

Filed Sept. 9, 1970, Ser. No. 70,744
Int. Cl. B01d *21/00*
U.S. Cl. 210—83 **15 Claims**



Method and apparatus for deploying a floatable barrier is disclosed wherein the barrier is initially collapsed in a storage location provided by a container having means allowing escape of the barrier from the storage location upon sinking of the container and means for sinking the container. As the container is sunk, the barrier floats out of the storage location and may be deployed merely by uncollapsing the same.

3,664,505

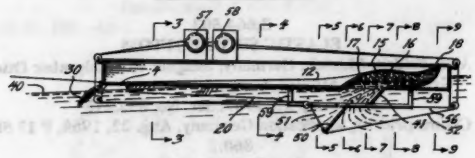
OIL COLLECTION DEVICE

Charles J. Brittingham, 112 Wooden Bridge Road, Holland, Pa.

Filed Feb. 18, 1970, Ser. No. 12,200
Int. Cl. C02b *9/02*
U.S. Cl. 210—242 **4 Claims**

Floating collection apparatus for skimming oil slicks from a body of water. The oil and water is subjected to pressure

generated by the weight and movement of the apparatus to eliminate the water adjacent to and entrained in the oil film prior to sending the oil to a collection tank.

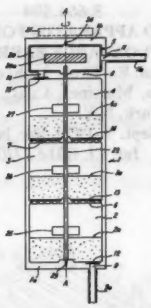


3,664,506

APPARATUS FOR PURIFYING BLOOD

Renee Louise Meunier, Paris, and Monique Adele Marmonier, Lyon, both of France, assignors to Sertna, Societe d'Etudes Et De Recherches De Techniques Nouvelles Appliquees S.A.

Filed Dec. 3, 1969, Ser. No. 881,800
Claims priority, application France, Dec. 3, 1969, 176342
Int. Cl. B01d *15/04*
U.S. Cl. 210—282 5 Claims



Apparatus for purifying blood comprises a vessel containing one or more chambers arranged in series and containing micro-beads which enclose adsorbents and reagents for purifying blood. The vessel also includes a stator cavity which contains a pump rotor, preferably driven by an external rotary magnet. Means for agitating the beads in the chamber preferably consist of vanes connected to the pump rotor. In a preferred arrangement of the apparatus, the beads in a first chamber nearest the inlet contain urease and a cation-exchange resin in the sodium state, the beads of the second chamber contain activated charcoal and an exchange resin in the hydrogen state, and the beads of the third chamber contain an anion-exchange resin in the OH state.

3,664,507

FILTER TUBES IN A RESILIENT HOLDER

George V. Jordan, Roslyn, Pa., assignor to Selas Corporation of America, Dresher, Pa.

Filed Apr. 15, 1970, Ser. No. 28,689
Int. Cl. B01d *29/20*
U.S. Cl. 210—323 7 Claims

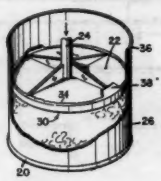
The invention is a filter unit for the fine filtration of various fluids with the filter element comprising a plurality of elongated, hollow rods made of a rigid porous material that are individually held in position by a resilient holder.

3,664,508

DISPENSING CONTAINER FOR PLASTIC MATERIALS

Joseph Linder, Cincinnati, Ohio, assignor to Fibre Glass-Evercoat Co., Inc., Cincinnati, Ohio

Filed Mar. 11, 1971, Ser. No. 123,324
Int. Cl. B67d *5/42*
U.S. Cl. 222—386 17 Claims



The dispensing container comprises a cylindrical body having end closure members one of which is securely though releaseably positioned to an end of the cylindrical body in such a manner as to be displaced therefrom and progressively advanced axially into and through the body, incident to advancement of a platen against the closure member for initially dislodging it from the cylinder body while simultaneously causing it to overlie the lower face and side edges of the platen, to extrude the contents of the container through an opening in the other closure member, or through a dispenser valve lid which replaces or which engages openings in the other closure member, incident to advancement of the platen into the container.

3,664,509

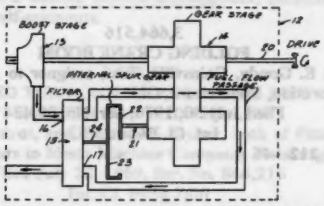
FLUIDS FLOW SYSTEM WITH SELF-FLUSHING REVOLVING FILTER

Raymond J. Grill, Richmond Heights, Ohio, assignor to TRW Inc., Cleveland, Ohio

Filed Nov. 4, 1969, Ser. No. 873,970
Int. Cl. B01d *33/22*
U.S. Cl. 210—391 8 Claims

Pumps or other fluids handling devices are protected from contaminants in the fluids by alternately presenting localized portions of a filter media to the flow paths of fluids entering and leaving the device to filter out the contaminants from the fluids entering the device and to flush out the filter media with the fluids leaving the device. In a preferred embodi-

ment, a continuous revolving filter intersects the inlet and discharge passages of a pump to divert contaminant particles in the fluid from the pump inlet to the pump outlet without



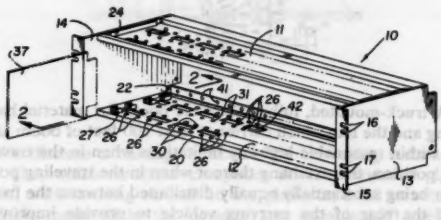
allowing the particles to pass through the pump, and concurrently backwashing the filter element by pressurized fluid from the pump.

3,664,510

CARD CAGE FOR PRINTED CIRCUIT CARDS

Walter E. Kerschbaum, Wellsboro, Pa., assignor to Eltra Corporation

Filed Apr. 16, 1970, Ser. No. 29,057
Int. Cl. A47g 19/08; B42f 17/16
U.S. Cl. 211—41 5 Claims



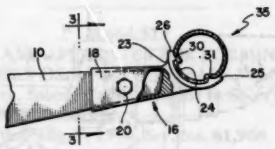
A card cage for printed circuit cards in which flexible plastic elements mounted in a metal frame securely but yieldably hold printed circuit cards in place.

3,664,511

HANGROD ASSEMBLY

Jay G. Fenwick, Albert Lea, Minn., assignor to Streater Industries, Inc., Albert Lea, Minn.

Filed Oct. 2, 1970, Ser. No. 77,648
Int. Cl. A47h 1/02
U.S. Cl. 211—105.1 6 Claims



A hangrod assembly which comprises an adapter which may be readily secured to a conventional support bracket and a longitudinally split tubular hangrod which is attachable to the adapter without the use of tools or fastening devices. The adapter and hangrod have mutual engaging and cooperable ridges and grooves which allows the hangrod to be snapped into place by pressing the hangrod from an open unconfined state to a closed, confined state.

3,664,512

HANGER CONSTRUCTION

Marjorie O. Smith, 325 North Highway 59, Barrington, Ill.

Filed Oct. 23, 1970, Ser. No. 83,291
Int. Cl. A47f 5/08
U.S. Cl. 211—113 7 Claims

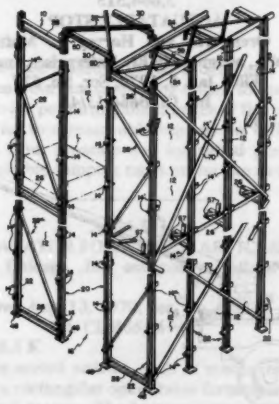
A hanger construction is provided for removably mounting various articles such as cups, pails, and various tools on a supporting surface. The construction includes a channel member secured to the supporting surface, and a hanger element carried by said channel member and adjustable longitudinally thereof to selected positions. The hanger element is provided with a head portion and a manually adjustable member, the latter being adapted, when in one position of adjustment, to resiliently sandwich portions of the channel member between said head portion and resilient member and retain said hanger element in a selected position.

3,664,513

STORAGE FRAME COMPONENTS AND ASSEMBLY THEREOF INTO A STORAGE RACK FOR USE IN AUTOMATIC WAREHOUSING SYSTEMS

Wayne G. Atwater, Willoughby, Ohio, assignor to The Triax Company, Cleveland, Ohio

Filed July 20, 1970, Ser. No. 56,269
Int. Cl. A47f 5/00
U.S. Cl. 211—134 23 Claims



A storage framework composed of a plurality of storage frame elements or components assembled into a storage rack for use in an automatic warehousing system. The framework comprises generally parallel rows of vertical columns with each of the columns comprising in certain embodiments a pair of channel-like members with the cross webs thereof disposed in spaced back-to-back relation. Load carrying

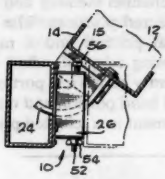
members are spaced vertically along the columns and define the storage volumes in the storage rack. The load carrying members each comprise a portion disposed in sandwiched relation between the respective pair of channel-like members and means extending between each of the load carrying members and the channel-like members of the columns for connecting the latter together. The components are adapted to be shipped to the location of use and assembled there. The arrangement facilitates the fabrication, preparation, and handling of the storage rack components and also facilitates their assembly at the location of use. Other embodiments provide a double K-like load support arrangement tying outer and aisle columns together, with the latter comprising single channel-like members.

3,664,514

LOCK FOR HINGED RACK

King B. Drake, Los Angeles, Calif., assignor to Dracon Industries, Chatsworth, Calif.

Filed Mar. 2, 1970, Ser. No. 15,506
Int. Cl. A47f 5/02
U.S. Cl. 211—169 **6 Claims**



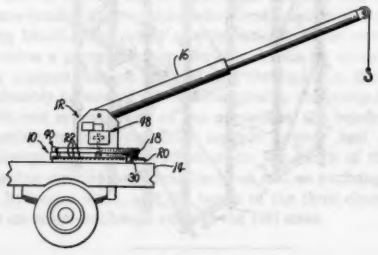
A rack for heavy equipment is hinged on a post and the lock is secured therebetween. A finger extends from the rack into an opening in the post and engagement means secures the finger with respect to the post to lock the rack with respect thereto. In the preferred embodiment, the finger is a curved channel having openings in its web and the engagement means is a plunger which selectively engages the web openings.

3,664,515

ACTUATABLE STOP

Maxwell C. Orendorff, and Harvey L. Mattern, both of Fresno, Calif., assignors to Ely Enterprises, Inc.

Filed Jan. 5, 1970, Ser. No. 627
Int. Cl. B66c 13/48
U.S. Cl. 212—39 **1 Claim**



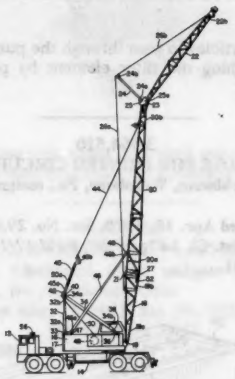
An actuatable stop particularly suited for use as a "dead man" stop in arresting "drift" for cranes and the like, characterized by a rigid stop ring circumscribing an associated crane's pedestal and an actuatable locking mechanism including a reciprocating shaft adapted to extend from the pedestal into locking engagement with the ring in response to an actuation of an associated control, a feature of the stop being the inclusion of means for extending the shaft in response to a detected power-off condition for the crane, whereby rotation of the pedestal automatically is arrested as the crane's power train is de-activated.

3,664,516

FOLDING CRANE BOOM

William E. Goudy, Gainsville, Tex., assignor to Armco Steel Corporation, Middletown, Ohio

Filed July 30, 1970, Ser. No. 59,454
Int. Cl. B66c 23/62
U.S. Cl. 212—46 A **8 Claims**



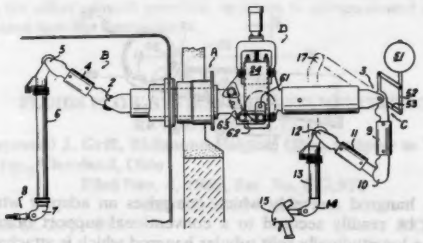
A truck-mounted, fully collapsible boom for material handling and the like which carries at least 100 feet of boom and jib within reasonable highway limitations when in the traveling position, the overhang thereof when in the traveling position being substantially equally distributed between the front and the rear of the carrying vehicle to provide improved maneuverability and weight distribution on the axles of the carrying vehicle.

3,664,517

ARTICULATED MASTER-SLAVE MANIPULATOR

Jean-Claude Germond, Paris; Jean-Pierre Guilbaud, Jouars-Pont-Chartrain, and Jean Vertut, Paris, all of France, assignors to Commissariat A L'Energie Atomique, Paris, France

Filed Sept. 28, 1970, Ser. No. 76,139
Claims priority, application France, Oct. 3, 1969, 6933811
Int. Cl. B25j 1/02
U.S. Cl. 214—1 CM **8 Claims**



An articulated master-slave manipulator comprises a master assembly and a slave assembly articulated to opposite ends of a tube extending through a wall.

The slave assembly comprises a first segment and a second segment which are disposed in that order from the tube

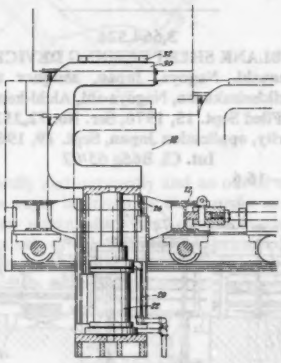
which extends through the wall, whereas the master assembly comprises, from its articulation to the tube, a top second half-segment which drives the slave-assembly second segment, a first segment which drives the slave assembly first-segment, and a bottom second half-segment, parallel to the top second half-segments.

3,664,518

POWERED TURNAROUND FOR A COIL LIFT AND TRANSFER CAR AND THE LIKE

Andrew J. Petros, and Clement S. Rybar, both of Pittsburgh, Pa., assignors to Mesta Machine Company, Pittsburgh, Pa.

Filed July 22, 1969, Ser. No. 844,216
Int. Cl. B65g 7/00
U.S. Cl. 214—1 Q **11 Claims**



We disclose a carriage structure for conveying coils and the like, which structure comprises a wheel-mounted platform, a lift housing carried on the platform, a lift structure slidably mounted in the housing and engaging lift means mounted within the lift housing so that the lift structure is raised and lowered upon actuation of the lift means. The lift structure includes an upper projection shaped for closely fitted insertion into an opening in an external load support. Load bearing platen is rotatably mounted adjacent the upper surface of the projection and substantially within the confines thereof, and a turnaround mechanism for the platen is mounted within the confines of the projection and in operative engagement with the platen. In certain applications, a thrust bearing is mounted between the platen and adjacent surfaces of the projection. The platen and the projection surfaces can be shouldered to accomodate the bearing. The turnaround mechanism can b both double-acting and bidirectional for the application of maximum torque to the platen.

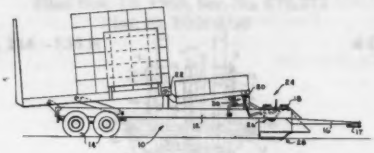
3,664,519

METHOD AND APPARATUS FOR FORMING A TIE PATTERN OF BALES ON A BALE WAGON

Donald M. Grey, Selma, Calif., assignor to Sperry Rand Corporation, New Holland, Pa.

Filed Aug. 7, 1970, Ser. No. 61,966
Int. Cl. B65g 57/26
U.S. Cl. 214—6 B **20 Claims**

A method and apparatus for forming a tie pattern of bales on a stacking table of a bale wagon. The method includes the steps of receiving a first array of longitudinally aligned bales on the stacking table, fixing the outermost or flanking bales of the first array for pivotable movement about a point, removing the bale or bales extending between the flanking bales of the first array, and inserting a series of a second array of longitudinally aligned bales generally midway between the fixed flanking bales. The apparatus for forming the tie pattern comprises tines extending through a stacking table for fixing the flanking bales for pivotal movement about a point, paddles for removing the bale or bales extending



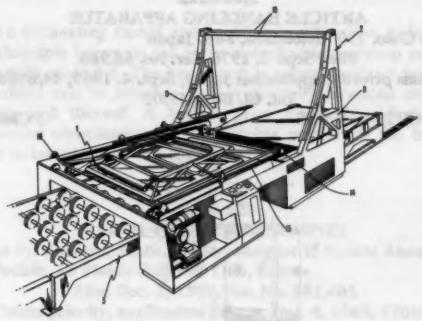
between the flanking bales of the first array and a receiving table disposed adjacent the stacking table for transferring bales thereto in either the first array or second array.

3,664,520

HANDLING AND TRANSFERRING DEVICE FOR PLANE OBJECTS, PARTICULARLY GLASS SHEETS

Bernard Parnet, Courbevoie, France, assignor to Compagnie de Saint-Gobain, Neuilly-sur-Seine, France

Filed Jan. 21, 1970, Ser. No. 4,547
Claims priority, application France, Jan. 22, 1969, 6901146
Int. Cl. B65g 67/00
U.S. Cl. 214—7 **6 Claims**



A method for the handling of flat articles and the transfer of these articles from one supporting means to another. More precisely, a device permitting the transfer of flat articles from a feeding carrier to a removable support on which the articles are piled from separate and individual pieces without damage into suitable shipping cases or the like as desired.

3,664,521

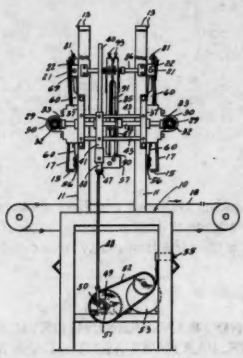
SEPARATOR FOR NESTED ARTICLES

Jozsef Feher, Chicago, Ill., assignor to Alfred Eisenberg, Chicago, Ill.

Filed Aug. 13, 1970, Ser. No. 63,437
Int. Cl. B65g 59/06
U.S. Cl. 214—8.5 K **4 Claims**

Separator for nested articles, such as compartmented cartons including a rectangular open frame forming a hopper for a stack of nested cartons. The bottom carton of the stack of cartons is supported on swingable support members moved into and out of supporting engagement with the bottom carton under the control of individual cams. Separator fingers on the ends of swingarms are positioned at all four sides of the frame and come into the space between the rim of the bottom carton and the next adjacent carton, as the support members move out of engagement with the bottom carton and exert a downward separating force on the bottom carton as the stack of cartons is supported by support fingers engag-

ing under the rim of the next to the bottom carton of the stack. The cam moving the separator fingers into the space between the rims of the two lowermost cartons also moves the support fingers into supporting engagement with the rim



of the next adjacent uppermost carton. This cam has means thereon moving the separator fingers downwardly to separate the bottom carton from the stack of cartons, while holding the stack by the support fingers.

3,664,522

ARTICLE HANDLING APPARATUS

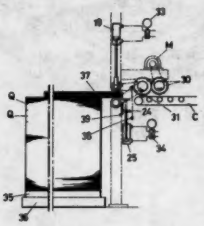
Yuro Goto, 250 Motoichiba, Fuji, Japan

Filed Sept. 2, 1970, Ser. No. 68,988

Claims priority, application Japan, Sept. 4, 1969, 44/69862

Int. Cl. B65g *59/02*

U.S. Cl. 214—8.5 SS **3 Claims**



An article handling apparatus is disclosed for feeding and transferring layers of sheet materials from one working station to another in a paper-making mill. The apparatus includes a pair of elongated rollers concentrically disposed and rotated by a chain and sprocket drive in a direction opposite to each other for gripping the article therebetween and moving the same forward toward a conveyor, means for limiting the position of feed of articles between the rollers and two pneumatic or hydraulic cylinders, one for imparting a vertical movement to one of said pair of rollers and the other for moving said means vertically into and out of the path of movement of the articles.

3,664,523

VEHICLE PARKING APPARATUS WITH AN ANNULAR ELEVATOR PLATFORM

Carl Heinrich Hagel, Einerachtstrasse 24, 46 Dortmund, Germany

Original application Mar. 25, 1965, Ser. No. 442,654, now Patent No. 3,419,161, dated Dec. 31, 1968. Divided and this application Dec. 18, 1967, Ser. No. 721,891

Claims priority, application Austria, Apr. 13, 1964, A 3186/64

Int. Cl. E04h *6/06*

U.S. Cl. 214—16.1 A **6 Claims**

An elevator structure in combination with a building having an external helical track therearound, wherein there are load-storage spaces in the building and load-transfer means on the elevator and wherein the elevator rides on the external helical track by virtue of drive means mounted in the

elevator, there being provided separate drive means adapted to transfer loads from the building to the elevator and vice-versa.

3,664,524

BLANK SHEET FEEDING DEVICE

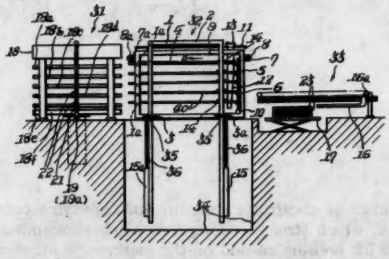
Toshio Yamauchi, Nagoya, Japan, assignor to Kabushiki Kaisha Meikiseisakusho, Nagoya-shi, Aichi-ken, Japan

Filed Sept. 15, 1970, Ser. No. 72,252

Claims priority, application Japan, Sept. 19, 1969, 44/74896

Int. Cl. B65g *65/02*

U.S. Cl. 214—16.6 **7 Claims**



Apparatus for feeding sheets to a multistage hot press is characterized by including a plurality of interconnected sheet feed racks which are reciprocably carried on a supporting framework for the racks to be horizontally moved in unison relatively to the framework and into and out of multiple stages of a multistage hot press. Movably mounted pusher and restrainer means are provided for pushing sheets away from locations on rearward portions of the racks to locations on forward portions of the racks, and for occupying a given position wherein to restrain sheets disposed on rearward portions of the racks to move from the racks into a multistage hot press within multiple stages of the latter during horizontal movement of the racks out of multiple stages of a multiple stage hot press. Positioning means in the apparatus includes movable stops for the stops in a given position to restrain sheets disposed on forward portions of the racks to move from the racks onto a multistage hot press during horizontal movement of the racks out of multiple stages of a multistage hot press while the pusher and restrainer means in a given position restrains sheets on rearward portions of the racks to move from the racks onto a multistage hot press within multiple stages of the latter.

3,664,525

ROTATING GRAIN TANK UNLOADER

Franz Joseph Herbsthofer, Kassel-Harleshausen, Germany, assignor to Massey-Ferguson G.m.b.H., Kassel, Germany

Filed July 6, 1970, Ser. No. 52,489

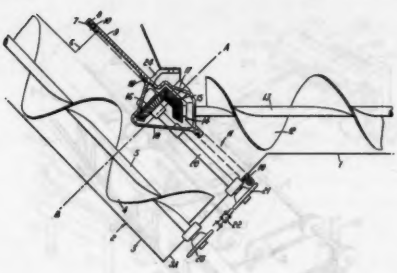
Claims priority, application Great Britain, July 25, 1969, 37,523/69

Int. Cl. B65g *65/46*

U.S. Cl. 214—17 D **3 Claims**

A grain handling apparatus for a combine harvester including a horizontal transfer auger in the bottom of the tank for

conveying grain to a discharge opening in the bottom of the tank and a discharge conveyor including a conduit and a discharge auger. The lower end of the discharge conveyor is rotatably mounted in continuous communication with the discharge opening for movement about an axis extending transversely of the conduit between an unloading position



inclined upwardly and outwardly and an out of use position. The discharge auger is driven by the transfer auger through bevel gears, an intermediate shaft rotatable about an axis parallel to the axis of the discharge auger, sprockets on the discharge auger and the intermediate shaft outside the conduit and an endless chain trained around the sprockets.

3,664,526

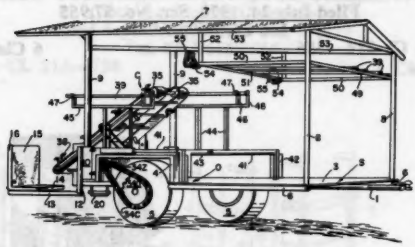
HARVESTER

Kelly S. Dilday, deceased, late of Ahoskie, N.C. (Stewart Anthony Dilday and Kelly Wayne Dilday, executors)

Filed Nov. 5, 1969, Ser. No. 874,320

Int. Cl. A01d *45/16*

U.S. Cl. 214—83.1 **26 Claims**



A harvester particularly useful in harvesting tobacco by providing a vehicle having vertically adjustable seats for persons who pick the leaves of tobacco with the vehicle having a support in the form of a conveyor for receiving the picked leaves from the persons and transporting the leaves to another location on the vehicle where one or two other persons place the tobacco on racks and such racks may be either the conventional tobacco sticks for drying in tobacco barns or may be pallets on which the tobacco leaves are laid and the pallets with the loaded leaves may be removed.

To obtain maximum advantage of the invention the crop is arranged in rows with two adjacent rows close together and alternate adjacent rows being spaced apart a sufficient distance for the vehicle to pass so that the vehicle has a low center of gravity and can be pulled by a conventional tractor.

3,664,527

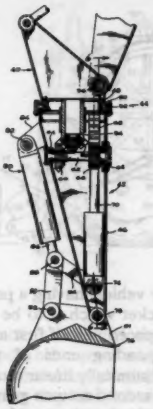
MATERIAL HANDLING APPARATUS

Ralph H. Short, Lima, Ohio, assignor to Clark Equipment Company, Buchanan, Mich.

Filed Nov. 10, 1969, Ser. No. 875,272

Int. Cl. E02f *3/00*

U.S. Cl. 214—138 R **4 Claims**



An excavating shovel and backhoe combination including a telescopic boom on the outer end of which a boom arm is pivotally mounted. The boom arm is rotatable about its longitudinal axis to rotate a bucket pivotally mounted on the lower end thereof. A bucket pivot hydraulic cylinder is mounted completely on the rotatable portion of the boom arm to be rotatable with the bucket.

3,664,528

EARTH-WORKING MACHINES

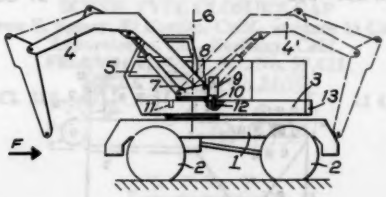
Yves M. Gauchet, Senlis, France, assignor to Societe Anonyme Poclain, Le Plessis-Belleville Oise, France

Filed Dec. 2, 1969, Ser. No. 881,405

Claims priority, application France, Dec. 4, 1968, 176600

Int. Cl. E02f *3/00*

U.S. Cl. 214—138 R **3 Claims**



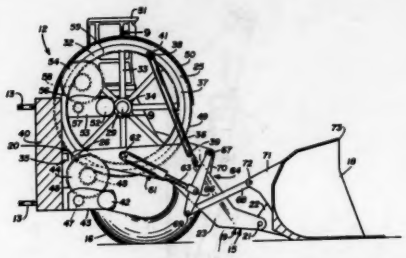
This invention relates to an earth-working machine comprising a platform equipped with a driver's cabin which is fast therewith and is oriented in the direction of translation of the machine, and with an operating equipment mounted to pivot, with respect to the driver's cabin, about a substantially vertical axis, said operating equipment being able to pivot at least substantially through 90°, while the axis of rotation is disposed to the side of the driver's cabin, wherein said driver's cabin is disposed at the front of the platform, while rotation locking means may render integral the operating equipment and the driver's cabin for two positions of the operating equipment moved from one to the other by a pivoting through at least 90°.

3,664,529

APPARATUS FOR MANIPULATING LOAD SUPPORTING MEMBER

Nick Petelski, Dallas, Tex., assignor to Peerless Mfg. Co., Dallas, Tex.

Filed June 15, 1970, Ser. No. 46,325
Int. Cl. E02f 3/62
U.S. Cl. 214—140 9 Claims



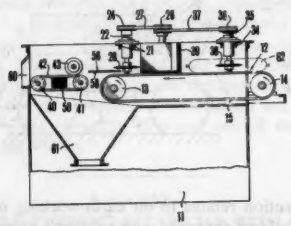
A front end loader vehicle having a pair of booms attached to an excavating bucket which is to be manipulated relative to the vehicle by a spaced pair of first arcuate gear segments which have corresponding ends of the booms attached thereto to permit substantially linear movement of the booms and a spaced pair of second arcuate gear segments connected to the booms to permit elevating and lowering of the booms. Each of the first gear segments has a peripheral ring provided with radially outwardly extending teeth. Each of the second gear segments is contained within the peripheral ring of a first gear segment and is provided with a peripheral ring having radially inwardly extending teeth to form a compact apparatus for manipulating the bucket.

3,664,530

APPARATUS FOR AUTOMATICALLY AND SUCCESSIVELY OPENING THE BAGS OF POWDER

Hirofumi Takiguchi, Osaka, Japan (2-kumi, 7-chome, Kumagaya-cho Kokura-ku, Kitakyushu, Fukuoka Prefecture, Japan)

Filed June 15, 1970, Ser. No. 46,106
Claims priority, application Japan, June 14, 1969, 44/56,252; Sept. 3, 1969, 44/70,878, 44/84,900; Oct. 30, 1969, 44/104,940; Nov. 24, 1969, 44/111,541
Int. Cl. B65b 67/00
U.S. Cl. 214—302 27 Claims



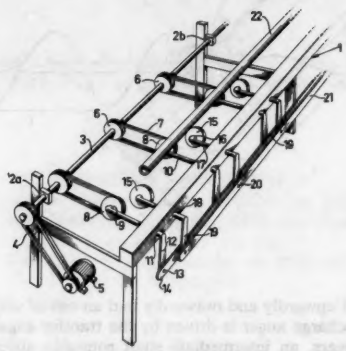
An apparatus for automatically and successively opening powder containing bags. A conveyor is provided on which the bag is transported. Cutters are positioned along the conveyor which cut open usually three sides of the bag as it is transported by said conveyor. The contents of the opened bag are collected in a collecting means positioned below the end of the conveyor, and a bag takeup means takes up the opened bag as it is unfolded around the uncut side of the bag.

3,664,531

DEVICE FOR IMPARTING A ROTATIONAL AS WELL AS A LONGITUDINAL MOVEMENT TO TUBES OR RODS

Kjell I. Magnusson, Fack 33 67050, Eda Charlottenberg, Sweden, and Rune T. Owarfort, Lya O. Karup, Ostra Karup, Sweden

Filed Nov. 19, 1969, Ser. No. 878,097
Int. Cl. B65h 51/26
U.S. Cl. 214—339 2 Claims



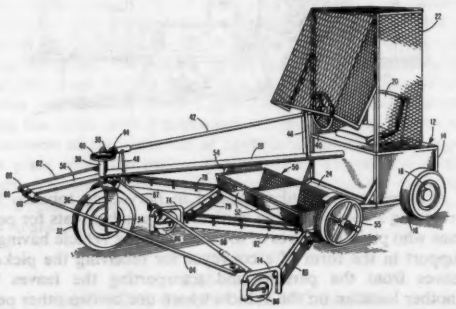
A device for supporting an elongated work piece such as tubes or rods with circular or annular section during treatment thereof and giving the work piece a rotational feeding movement as well as a longitudinal feeding movement with the speed of the longitudinal movement being very slow as compared with the rotational movement of the workpiece.

3,664,532

PROPULSION MEANS FOR BALL RETRIEVING APPARATUS

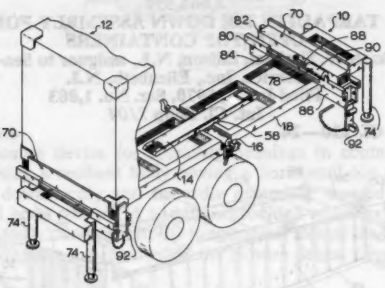
August W. Gustafson and Edna L. Gustafson, both of 4750 Baldwin Blvd., Corpus Christi, Tex. 78408

Filed July 24, 1970, Ser. No. 57,955
Int. Cl. B60p 1/00
U.S. Cl. 214—356 6 Claims



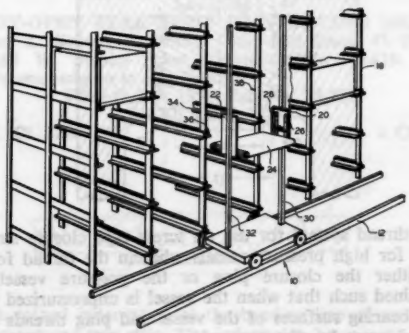
A ball retrieving mechanism in the form of a self propelled vehicle having a tricycle type running gear with the ball gathering and retrieving means arranged between the front wheel and the rear driving wheels so that the balls are picked up before the rear driving wheels pass over the ground area from which the balls are recovered.

3,664,533
FREIGHT CONTAINER TRANSFER SYSTEM
Albert Michael Hand, York, Ontario, Canada, assignor to Steadman Industries (Nassau) Limited, Nassau, The Bahamas
Filed Dec. 8, 1969, Ser. No. 882,893
Int. Cl. B60p 1/64
U.S. Cl. 214—516 15 Claims



A freight container transfer system wherein an elongated rack is detachably connectable between a push-pull transfer motor on a transfer vehicle and the base of a freight container. The rack has a movable stop on its upper surface, selectively engageable with a container base, and a series of openings in its lower surface engageable successively, with a ratcheting action, by the push-pull motor enabling the container to be transferred over the side of the transfer vehicle. A set of slidable support bolsters on the transfer vehicle, extendible and retractable over the side thereof, facilitate the transfer operation.

3,664,534
LATERAL SHUTTLE DEVICE FOR MATERIAL STORAGE SYSTEM
Calvin W. Hunter, Battle Creek, Mich., assignor to Clark Equipment Company
Filed Sept. 2, 1970, Ser. No. 69,077
Int. Cl. B66f 9/14
U.S. Cl. 214—730 1 Claim

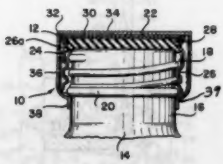


Apparatus for moving material on and off of supports in which the material is conveyed horizontally on a belt conveyor and both horizontally and vertically by swinging the conveyor through an arc.

3,664,535
SEALING CONSTRUCTION
Herbert B. Mette, Strongsville, Ohio, assignor to Questor Corporation
Filed Mar. 26, 1970, Ser. No. 22,859
Int. Cl. A61j 9/00
U.S. Cl. 215—11 R 1 Claim

The sealing construction herein is shown in a preferred embodiment in a disposable nurser which includes a plastic shell, a sack-like container partially disposed within the shell and having its top draped over the top of the shell, and a screw cap-nipple combination. A lower flange on the nipple and the sack top cooperate to act as a gasket means. The shell top terminates in an inwardly extending flange. A circular projection is formed on the shell flange extending up toward the combination gasket. The projection is spaced inwardly from the junction of the inner side of the wall of the shell top and the shell flange to provide a spring action by the flange which will maintain a sealing relationship between the circular projection and the gasket combination when the cap is screwed on. The spring action of the shell flange permits the flange to yield when excessive cap torque is applied to prevent the circular projection from cutting, weakening or otherwise damaging the inner container portion of the gasket combination. A fillet is advantageously formed between the shell top inner wall and the shell flange to reinforce the junction and control the spring action of the shell flange.

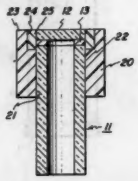
3,664,536
SCREW TYPE CLOSURE CAP
Byron E. Emery, El Cerrito, Calif., assignor to Cutter Laboratories, Inc., Berkeley, Calif.
Filed May 22, 1970, Ser. No. 39,611
Int. Cl. B65d 23/00, 53/00
U.S. Cl. 215—40 11 Claims



The screw type closure cap includes a first cap for directly sealing a container opening having internal engagement means for engaging closure retaining means on the container. The internal engagement means is formed to permit limited longitudinal movement of the first cap relative to the closure retaining means after engagement

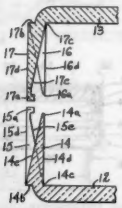
therewith. An overcap is formed to overlie said first cap and apply pressure thereto to move said first cap longitudinally and increase the sealing pressure thereof against the open end of the container.

3,664,537
SEAL AND CLOSURE FOR ION-SELECTIVE ELECTRODE
Willard T. Grubb, Schenectady, N.Y., assignor to General Electric Company
Filed Dec. 2, 1970, Ser. No. 94,284
Int. Cl. H01j 61/30
U.S. Cl. 220—2.1 R 4 Claims



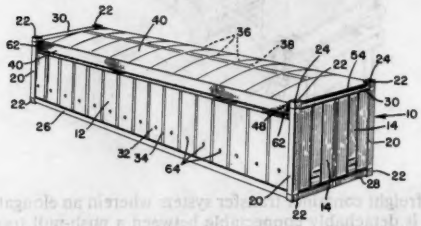
A closure seal for an ion-selective electrode has a room temperature sealant sealing an ion-selective material disc with a flat surface or with a controlled radius of curvature to one open end of a non-ion selective tube, an apertured member surrounding the disc, sealant and a portion of the tube, one end of the member being flush with the exterior surface of the disc, the same end of the member having an enlarged portion defining an opening adjacent the disc, sealant, and a portion of the tube, and a second room temperature sealant in the opening of the enlarged portion of the member. One such ion-selective electrode includes also a silver wire with a silver chloride portion positioned within the tube, a buffered chloride solution within the tube and in contact with the silver chloride portion of the silver wire, a closure over the opposite end of the tube with an aperture therein and a portion of the silver wire extending through the aperture in the closure to the exterior of the tube. A method of forming such a closure seal is also described.

3,664,538
NESTABLE RECEPTACLE AND CONTAINER
Donald W. Fioretti, 414 Wintergreen Ave., Hamden, Conn. 06515
Filed Dec. 21, 1970, Ser. No. 100,158
Int. Cl. B65d 7/00
U.S. Cl. 220—4 E 11 Claims



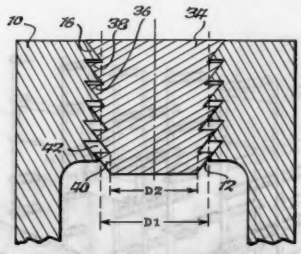
A nestable receptacle comprising a bottom member and a plurality of upstanding, flexible, first and second ear members on the periphery of the bottom member. The first ear members alternate in position on the periphery with the second ear members. Each of the first ear members has an outwardly projecting bottom edge adjacent the periphery of the bottom member, and has an outer wall inclined inwardly from the bottom member. Each of the second ear members has an inner wall inclined outwardly from the bottom member. The receptacles when engaged as described form a container having a cavity between the bottom members of the receptacles defined by the vertical dimensions of the walls of the first ear members.

3,664,539
TARPAULIN TIE DOWN ASSEMBLY FOR OPEN TOP CONTAINERS
Prakash W. Shahani, Edison, N.J., assignor to Sea-Land Service, Inc., Elizabeth, N.J.
Filed Jan. 7, 1970, Ser. No. 1,083
Int. Cl. B60p 7/04
U.S. Cl. 220—24 4 Claims



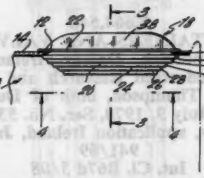
A tie-down assembly for securing a tarpaulin to an open top freight container in a weathertight, tamperproof manner including a plurality of displaceable ring members secured to a tarpaulin by a rope extending around the container. The rings, spaced from the container side walls by brackets, are aligned with eyelets extending around the marginal edges of the tarpaulin. The rope, laced through the ring members exteriorly of the tarpaulin, is provided with means for securing the ends together for receiving a seal.

3,664,540
VARIABLE CLEARANCE THREAD CLOSURE
Donald E. Witkin, Warren, Pa., assignor to National Forge Company, Irvine, Pa.
Filed June 11, 1970, Ser. No. 45,305
Int. Cl. B65d 41/04
U. S. Cl. 220—39 R 8 Claims



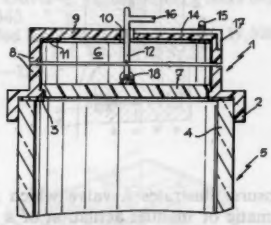
A thread system for use on screw type closure structures for high pressure vessels wherein the thread form of either the closure plug or the pressure vessel is machined such that when the vessel is unpressurized the load bearing surfaces of the vessel and plug threads are spaced apart by distances which vary from a predetermined maximum between the innermost threads to a predetermined minimum at the outermost threads. The variable clearance between the threads is calculated so as to enable the outer threads to deflect as levers in order that all of the threads are uniformly stressed when the vessel is pressurized.

3,664,541
CLOSURE PLUG
Asa P. Ruskin, 865 West End Ave., New York, N.Y. 10025
Filed Feb. 20, 1970, Ser. No. 13,114
Int. Cl. B65d 41/00
U.S. Cl. 220—42 B 1 Claim



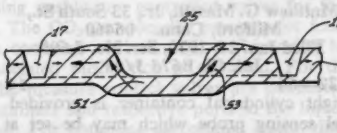
A closure device for resealing openings in containers comprising a resilient body having a horizontal top plate and a downwardly and inwardly extending tapered and stepped body portion. A handle is provided which extends substantially the length of the longitudinal axis of the body for facilitating the removal of the closure device from the opening.

3,664,542
VACUUM CLOSURE FOR OPEN ENDED CONTAINERS
Gregory John Wolfe, 15 Rue de Neufchatel, 1060 Brussels, Belgium
Filed Mar. 16, 1970, Ser. No. 19,864
Int. Cl. B65d 51/16
U.S. Cl. 220—44 7 Claims



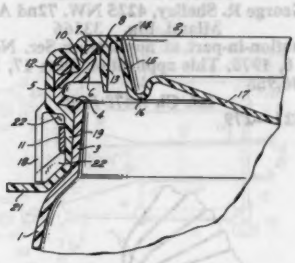
This invention has for its object a vacuum closure adapted for containers with one open end. Said closure is provided with means for reducing the pressure of air in the containers which use such closure.

3,664,543
EASY-OPEN TEAR STRIP REINFORCING MEANS
Omar L. Brown, Kettering, Ohio, and Ernal C. Fraze, 355 W. Stroop Road, Dayton, Ohio 45429; said Brown assignor to said Fraze
Filed Oct. 8, 1970, Ser. No. 79,218
Int. Cl. B21d 51/38
U.S. Cl. 220—54 6 Claims



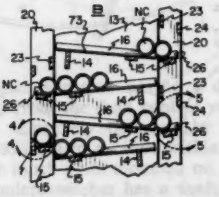
A coined indentation at the bending line of an easy-open can end tear strip. The indentation has nearly vertical side walls of increased thickness and the metal between the coined area and the tear-strip severing score is in compression. This prevents the formation of cracks in the score and increases the strength of the strip to prevent its breaking when a crease is formed when the can is opened improperly.

3,664,544
CONTAINER CONSTRUCTION
Wilhelm Hammes, Haupstrasse 38, D–5203, Much, Germany
Filed Feb. 19, 1971, Ser. No. 116,797
Claims priority, application Germany, Feb. 21, 1970, P 20 08 111.2
Int. Cl. A47j 27/08, 36/10; B65d 45/00
U.S. Cl. 220—60 R 10 Claims



A barrel of synthetic plastic material includes a substantially cylindrical main body portion and a head portion at one axial end and of one piece with the main body portion. The head portion has a circumferential wall having a first annular section substantially parallel with the longitudinal axis of the main body portion, a second annular section inclined inwardly at a greater angle and a third annular section projecting axially from the second section and inclined inwardly at a lesser angle. The third section has an outer free edge provided with a radially outwardly projecting circumferential bead and an inner free edge bounding an opening. A cover of synthetic plastic material overlies the head portion and comprises an outer annular rim portion of which exteriorly surrounds the head portion and has a circumferential rib abutting the second and third sections and engaging beneath the bead, and inner annular rim portion projecting into the opening proximal to the inner free edge, and a transverse portion of one piece with the inner annular rim portion spanning the opening. A sealing element is sealingly confined between and in abutment wtih the second annular section, the outer rim portion and the rib. At least one strap element encircles the outer rim portion and tightly urges the same into contact with the first annular section.

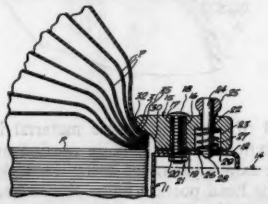
3,664,545
CYLINDRICAL CONTAINER STORAGE CONSTRUCTION
Scott L. Beesley, 464 West 5566 South, Murray, Utah 84107
Filed Aug. 6, 1970, Ser. No. 61,589
Int. Cl. B65g 57/28
U.S. Cl. 221—176 7 Claims



A storage and dispensing cabinet for cylindrical containers having chute rails, along which cylindrical containers, or cans, are progressed by means of vertically

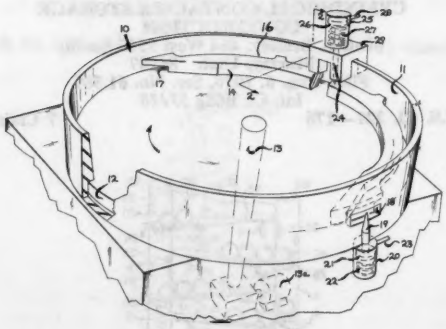
reciprocating chute rail extensions having hold back means. In the uppermost position the chute rail extensions receive cans and in the lower position, transfer previously received cans to the lower rails while holding back the upper rows of cans.

3,664,546
PLATE SEPARATOR FOR SELF-LEVELING PLATE DISPENSERS
George R. Shelley, 4225 NW. 72nd Ave., Miami, Fla. 33166
Continuation-in-part of application Ser. No. 35,771, May 8, 1970. This application June 17, 1970, Ser. No. 46,958
Int. Cl. A47f *1/06*
U.S. Cl. 221—279 5 Claims



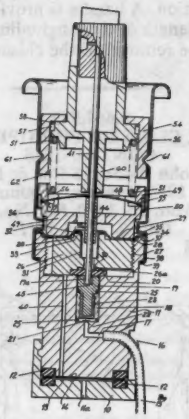
A plate separator for use with disposable paper or plastic plates being dispensed from a self-leveling well-type plate dispenser is described. A body member having a convex undersurface portion projecting radially into the dispensing well opening presses reactively against a plurality of the uppermost plates of an inverted stack in the dispenser well, at one side thereof, to separate them in fan-like fashion at the other side for easy withdrawal in a dispensing operation.

3,664,547
ARTICLE FEEDING MECHANISM
Raymond J. Dwyer, 4737 Secor Road, Toledo, Ohio 43623
Filed May 12, 1970, Ser. No. 36,606
Int. Cl. B65g *59/00*
U.S. Cl. 221—259 2 Claims



A rapid feeder of articles, such as nuts, in which, by the use of a rotating disc, the articles are arranged in a row and when a predetermined number has been reached, a stop plunger is actuated to prevent feeding additional articles to such row and another stop plunger at the outlet end retracts to discharge those articles in the group. Both the feeding and discharge of the articles is accomplished speedily by the same rotating disc. After a group of articles is discharged, the stop plungers are again actuated, one to prevent the discharge of articles, and the other to admit articles to form the group.

3,664,548
AEROSOL CONTAINERS AND VALVES THEREOF
Rory Wilson Broderick, Dalkey, Ireland, assignor to Institute for Industrial Research and Standards, and Norman John Thompson, both of Dublin, Ireland
Filed July 9, 1970, Ser. No. 53,591
Claims priority, application Ireland, July 10, 1969, 941/69
Int. Cl. B67d *5/08*
U.S. Cl. 222—61 24 Claims

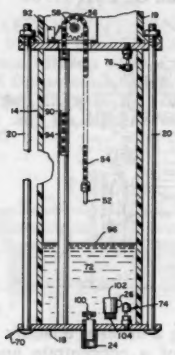


The disclosure illustrates a valve which may be used for the automatic or manual actuation of a dispenser for pressurised fluids. The valve incorporates a permeable membrane, for example a low density polyethylene film, which allows vapour from the dispenser to permeate into the valve and give rise to a pressure build-up under a sealed diaphragm. The pressure build-up eventually causes the diaphragm to release a spring mechanism to actuate the spray or aerosol discharge. Once discharge is complete the vapour under the diaphragm is discharged and the mechanism automatically reset to start the cycle again.

3,664,549
METHOD AND APPARATUS FOR MEASURING AND DISPENSING PREDETERMINED LIQUID VOLUMES
Matthew G. Maselli, Jr., 33 South St., Milford, Conn. 06460
Filed Jan. 26, 1970, Ser. No. 5,605
Int. Cl. B67d *5/08*
U.S. Cl. 222—64 14 Claims

An upright cylindrical container is provided with a liquid level sensing probe which may be set at a predetermined position in the container. The container is filled from a predetermined minimum level until the top surface of the liquid is sensed by the probe, discontinuing filling. The liquid is then discharged to the predetermined minimum level. The probe is preferably mounted at the end of a cable or chain. The probe is lowered to contact the surface of the liquid at its minimum level. The chain or cable is driven by a synchronous motor or stepping

motor. When driven by a synchronous motor, the motor is driven for a predetermined amount of time to raise the probe to the predetermined position. When driven



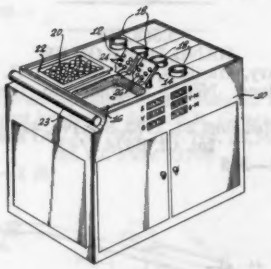
by a stepping motor, a settable counter provides the stepping motor with a predetermined number of stepping signals from a pulse source.

3,664,550

DISPENSING SYSTEM FOR BEVERAGES AND OTHER LIQUIDS

Olen E. Carothers, 15749 Gault St., Van Nuys, Calif. 91406, and Oliver E. Hinkle, 16012 Acre St., Sepulveda, Calif. 91343

Filed May 22, 1970, Ser. No. 39,586
Int. Cl. B67d 5/56
U.S. Cl. 222—129.2 19 Claims



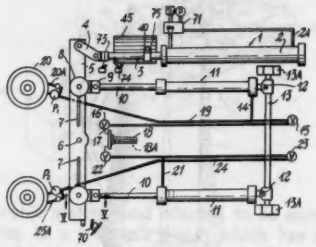
A liquid dispensing system is shown wherein a plurality of containers of water, syrups and liquors are connected to a source of carbon dioxide under pressure, and which have fluid outlets connected to ported dispensing heads containing pushbutton controlled valves for the different liquids. The CO_2 provides the pressure for forcing liquid from a container and through a dispensing head when the associated pushbutton is operated. For the liquors, hydraulic measure control valves are connected between the containers and respective ports in the liquor dispensing head. For obtaining carbonated water, different versions are disclosed which include a carbonator connected between the water container and a dispensing head for utilizing the CO_2 pressure as the force for mixing the CO_2 with and carbonating the water; and insulated containers for either or both carbonated water and plain water, wherein the CO_2 pressure is utilized to force either type of water from the container upon operation of the associated pushbutton at the dispensing head.

3,664,551

METERING ARRANGEMENT FOR POLYURETHANE ARTICLE PRODUCING MACHINES

Giuseppe Ferrari, Milan, Italy, assignor to S.p.A. Antonio Ferrari & Figli, Milan, Italy

Filed May 26, 1970, Ser. No. 40,628
Claims priority, application Italy, June 3, 1969, 17,717/69
Int. Cl. B67d 5/46
U.S. Cl. 222—134 5 Claims



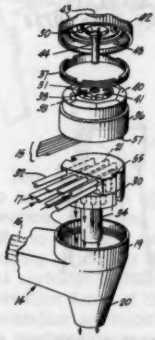
An arrangement for supplying metered amounts of different fluids to a station where said fluids are combined, wherein a reciprocating motor drives a rocking lever to which the pistons of metering cylinders are operatively connected, each of the metering cylinders are connected to a common head through a first valve and to a tank through a second valve, the shutting off for the metering is due to the cooperation of members, one of which is mounted along with the others on a drum which can be stepwise rotated, these members mounted on the drum being positioned along guides on the drum periphery.

3,664,552

CONTROL APPARATUS FOR FLUID DISPENSER

Clifford C. Carse, 8880 Kewen Ave., Sun Valley, Calif. 91352

Filed Feb. 2, 1970, Ser. No. 7,842
Int. Cl. B67d 5/60
U.S. Cl. 222—144.5 6 Claims

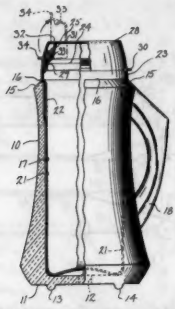


A multiple fluid dispenser having a dispensing head remotely located from the fluid control valves. The control valves are selectively operated by a plurality of microswitches mounted in a circle within the dispensing head. A circular touch plate mounted on a cammed surface above the microswitches has a shaft extending into an opening central to the microswitches. Pressure along a selected portion of the touch plate rotates the shaft to engage and actuate a respective microswitch which electrically opens an appropriate fluid valve to thereby initiate fluid flow through the dispensing head.

3,664,553
CARAFES

Carl H. Rickmeier, Jr., Sheboygan, Wis., assignor to The Vollrath Co., Sheboygan, Wis.

Filed May 25, 1970, Ser. No. 41,139
Int. Cl. B67d 5/06
U.S. Cl. 222—183 1 Claim

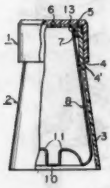


A plastic drinking water carafe featuring an outer, insulating shell formed of expanded polystyrene beads or similar inexpensive plastic material together with an inner container of polyethylene or other resilient, leakproof material which is adapted to removably fit within said outer shell, said inner container eliminating the possibility of the liquid leaking through said outer polystyrene shell, while the removable nature of said novel inner container permits the same to be withdrawn for washing or replacement when necessary.

3,664,554
CONTAINER FOR SPRINKLING POWDERED OR GRANULAR MATERIALS

Daiichi Shiozawa, Tokyo, Japan, assignor to Dai Nippon Insatsu Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 12, 1969, Ser. No. 875,717
Claims priority, application Japan, Nov. 16, 1968, 43/99,417
Int. Cl. A47g 19/24
U.S. Cl. 222—183 8 Claims

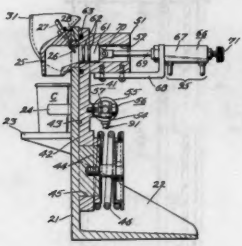


This invention relates to a container, which consists of a hollow cartridge and a bottomless hollow body used for sprinkling powdered condiments or granular materials. The hollow cartridge is charged with such powdered or granular materials and it has an opening mouth portion and a closed bottom wall or plate. The bottom plate has raised finger-grasping projections which are projected inwardly therefrom. The hollow body has a canopy in which a plurality of dispensing holes are provided for sprinkling such powdered or granular materials. The hollow cartridge can be inserted into and supported within the hollow body by suitable combination supporting and interlocking means.

3,664,555
MIXING AND DISPENSING UNIT

Wolf A. von Lersner, Cherry Hill, N.J., assignor to Campbell Soup Company, Camden, N.J.

Filed Nov. 23, 1970, Ser. No. 91,872
Int. Cl. C01f 11/04
U.S. Cl. 222—145 8 Claims

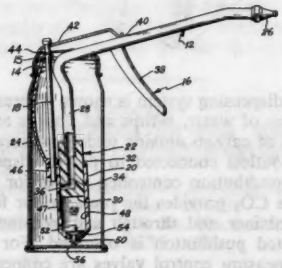


A unit for mixing a metered quantity of a diluent with a metered charge of a concentrate and dispensing the combined ingredients. The unit includes two reservoirs for different concentrates and a common dispensing outlet with a displaceable element arranged to selectively withdraw a metered charge of concentrate from either of said reservoirs and to discharge the same through the outlet along with the diluent. The displaceable element includes an expandable chamber device, in one position operatively connected to one reservoir in a second position operatively connected to a second reservoir and in a third position intermediate said first and second positions operatively connected to said dispensing outlet. The diluent is added to the concentrate in such a manner as to thoroughly flush the chamber device and the dispensing outlet when the movable element is in registry with the dispensing outlet. The movable element also serves as a valve for the connections to the reservoirs and the dispensing outlet.

3,664,556
HAND PUMP OILER

Max W. Perry, Hastings, and Norman D. Brockelsby, Grand Island, Nebr., assignors to Dutton-Lainson Company

Filed June 24, 1970, Ser. No. 49,320
Int. Cl. B67d 5/42
U.S. Cl. 222—385 5 Claims

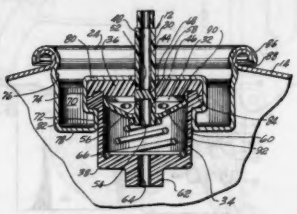


An improved hand pump oiler which includes a fixed piston having a port therethrough is connected with the oiler spout. A movable cylinder slides over the piston to pump oil through the spout upon each pumping stroke of the cylinder. A single inlet check valve is included in the cylinder and an integral piston valve is provided between the cylinder and piston. A plastic strap spring counteracts movement of the hand pump lever, thus insuring a return stroke of the cylinder.

ERRATUM

For Class 222—397 see:
Patent No. 3,664,508

3,664,557
BISTABLE SAFETY DISPENSING VALVE FOR FLUID DISPENSERS
Roger K. Bruce, Mission Viejo, Calif., assignor to Sterigard Corporation, Santa Ana, Calif.
Filed Nov. 13, 1970, Ser. No. 89,179
Int. Cl. B65d *83/00*
U.S. Cl. 222—397 **18 Claims**

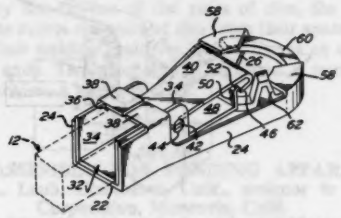


A valve stem of a dispensing valve for a pressurized dispenser is coupled to a bistable spring for movement to a vent position when the pressure within the dispenser exceeds normal dispensing pressures. The valve stem is maintained in the vent position by the bistable spring, which is in one of its stable positions, notwithstanding a drop in pressure within a dispenser. At normal operating pressures, the bistable spring is in its alternate stable position and resists dispenser pressure to maintain the valve stem out of the vent position. Under normal pressures, the valve is operated to dispense product by finger pressure applied to the valve stem against the spring to communicate a product port leading to a product passage with the interior of the dispenser. Actuation may be done by applying pressure either normal to the valve stem or axially along the valve stem.

3,664,558
GUN HOLSTER
Peter M. Tolliver, Brighton, N.Y., assignor of fractional part interest to Samuel R. Genca
Filed Oct. 23, 1970, Ser. No. 83,364
Int. Cl. F41c *33/00*
U.S. Cl. 224—1 R **9 Claims**

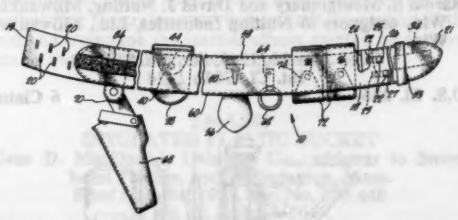
A gun holster wherein a rifle or gun may be carried in a horizontal position by a gun supporting member coupled normal to a side plate and is reversible for supporting the gun or rifle on the other side thereof in a vertical position for fast aiming and firing from the horizontal or vertical position.

3,664,559
REMOVABLE WATCH BAND
Mates A. Bruner, 1113 Wynnbrook Place, Secane, Pa. 19018
Filed Oct. 10, 1969, Ser. No. 865,325
Int. Cl. A44c *5/18*
U.S. Cl. 224—4 E **9 Claims**



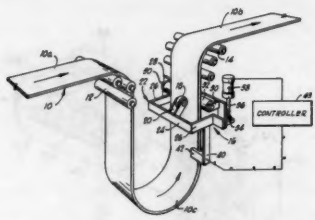
A removable watch band adapted to be secured on a watch casing of a woman's watch which has a circular opening at the top and bottom thereof. The watch band includes a hook-shaped member which is movable from a first position wherein one end can be inserted in the circular opening to a second position wherein the end will retain the band on the casing at the opening. Pivotable means are used for releasably securing the hook-shaped member in its retaining position.

3,664,560
BELT
Neale A. Perkins, Sierra Madre, Calif., assignor to Safariland Ltd., Inc., Monrovia, Calif.
Continuation-in-part of application Ser. No. 740,166, June 26, 1968. This application Jan. 16, 1970, Ser. No. 3,270
Int. Cl. F41b *13/04*
U.S. Cl. 224—5 R **15 Claims**



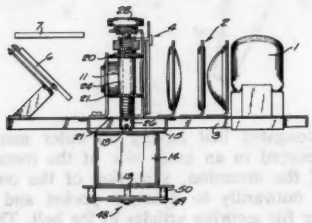
An elongated belt having an outer member and a lining secured to an inner side of the member. In one form of the invention, a portion of the outer member projects outwardly to define a pocket and a cartridge container for securing articles to the belt. The rear sides of the pocket and cartridge container are defined by the lining. In an alternative form of the invention, a pocket and a cartridge container are removably mounted on the belt. Brackets are mounted between the member and the lining and project through openings in the member to secure holding devices to the belt. Hidden hooks engage apertures in the belt to secure its ends to each other. A keeper for the free end of the belt includes a thistle-cloth fastener which mates with a cooperating fastener on the other end of the member. Alternatively, the keeper is drawn around the belt, through a guide loop at the free end of the belt, and folded back on itself for mating with a cooperating thistle-cloth fastener. A thistle-cloth fastener on the inner side of the belt secures the belt to the wearer's trousers or to a reversible dress belt which carries a mating fastener.

3,664,561
WEB GUIDING DEVICE
Bruce A. Feiertag, Oklahoma City, Okla., assignor to Fife Corporation, Oklahoma City, Okla.
Filed Nov. 26, 1969, Ser. No. 880,149
Int. Cl. B65h 25/26
U.S. Cl. 226—21 7 Claims



A device for guiding elongated flexible webs at a catenary or "free loop" in the web and including a steering roller carried by a framework which rotatably supports the roller for rotation about an axis extending substantially parallel to the plane of the web and in a position to contact the surface of the web. The framework is mounted for pivotation so that the rotational axis of the roller may be extended perpendicularly to the direction of travel of the web, or may be shifted to extend at various selected angles to such direction of travel. The roller is of a width, as measured along its axis of rotation, which is less than the width of the web as measured perpendicularly to its direction of travel. A suitable actuating device is provided for pivoting the framework in response to a sensed departure of the web from a desired course of travel.

3,664,562
PROJECTION APPARATUS FOR SEQUENTIAL TIMED PRESENTATION OF INDIVIDUAL FRAMES
Harold S. Montgomery and David J. Nutting, Milwaukee, Wis., assignors to Nutting Industries, Ltd., Milwaukee, Wis.
Filed June 30, 1969, Ser. No. 837,724
Int. Cl. G03b 1/24
U.S. Cl. 226—76 6 Claims

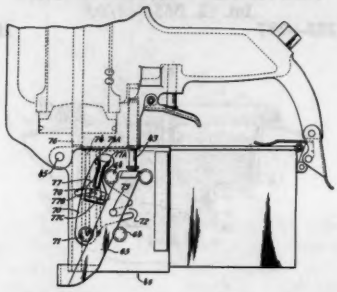


The disclosure includes a multiple frame film strip selectively aligned in a projector. The frames are divided into a plurality of different categories, with the corresponding sequenced information of the several categories presented as a group of adjacent frames on the film strip. A vibrating pole motor includes a one-way clutch driving a rotating shaft.

Film drive sprockets are connected directly to the shaft and movement of the shaft and sprockets stop within one-half cycle after removal of the applied alternating power.

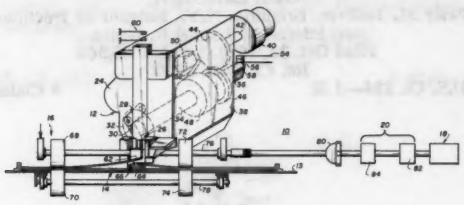
Each complete revolution of the shaft positions the film strip from a given question in a category to the next succeeding question in the same category. A switch unit is connected directly to the rotating shaft to control the sequential motor energization.

3,664,563
NAILING AND LIKE GUNS
Malcolm Edwin Hillier, Alresford, England, assignor to Gaston E. Marbaix, Limited, Basingstoke, Hampshire, England
Filed Sept. 12, 1969, Ser. No. 857,499
Claims priority, application Great Britain, Sept. 16, 1968, 43,933/68
Int. Cl. B27f 7/06
U.S. Cl. 227—7 9 Claims



The described invention resides in mechanism for feeding nails or other fasteners into a pneumatic nail-gun and it is basically a feed mechanism in which external power is applied in both senses of direction to a reciprocating nail-engaging element, the power for one sense deriving from dropping the gum on the workpiece and in the other sense from the available source of pneumatic pressure.

3,664,564
ELECTRONICALLY CONTROLLED STITCHING MACHINE
Stephen Stanton, Baltimore, and Edward Varholy, Glen Burnie, Md., assignors to Flynn & Enrich Company, Baltimore, Md.
Filed Sept. 16, 1970, Ser. No. 72,764
Int. Cl. B27f 7/06
U.S. Cl. 227—100 18 Claims



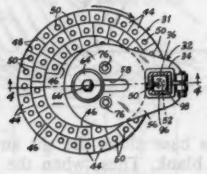
A stitching machine is disclosed which includes first means in the form of a stitching head for applying stitches to a work piece passing thereby; second means preferably in the form of cooperating pull rollers for conveying the work piece past the stitching head; a motor selectively connectable to the pull rollers for the operation thereof; interconnection means in the form of a clutch-brake combination responsive to preselected operating signals for selectively connecting and disconnecting the motor to the pull rollers to thereby effectuate incremental indexing of the work piece past the stitching head; and electronic control means for generating the preselected operating signals necessary to effectuate the incremental advance of the work piece through the machine. In a preferred embodiment, the electronic control means is responsive to the operation of the stitching head and includes circuitry designed to produce an extremely rapid energization and de-energization of the clutch brake combination

defining the aforementioned interconnection means whereby extremely accurate high-speed stitching is made possible.

3,664,565
AUTOMATIC FEED MECHANISM FOR NAILING GUNS

George P. Heilman, New York, N.Y., assignor to General Wire Overseas Corporation, St. Louis, Mo.

Original application Apr. 3, 1967, Ser. No. 627,952, now Patent No. 3,506,115, dated Apr. 14, 1970. Divided and this application Apr. 13, 1970, Ser. No. 48,704
Int. Cl. B25c *1/00*
U.S. Cl. 227—137 15 Claims

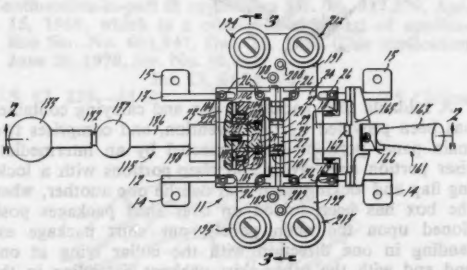


A nailing disk and feed mechanism for pneumatic nailing guns. The nailing disk is provided in the form of a plate with a helical or spiral string of nails inserted through the plate and weakened portions surrounding the nail head in order that the nail and surrounding material may be punched out from the machine disk in the nailing operation. The feed mechanism supports the nailing disk and feeds the helical string of nails in sequence to a driving tube with means for advancing the nailing disk through a spring housing and ratchet arrangement to provide for automatic feeding and advancement of the next nail after the driving operation.

3,664,566
COLD BUTT WELDING MACHINE

Walter J. Rozmus, Hubbardsville, N.Y., assignor to Kelsey-Hayes Company

Filed Apr. 13, 1970, Ser. No. 27,591
Int. Cl. B23k *21/00*
U.S. Cl. 228—3 14 Claims

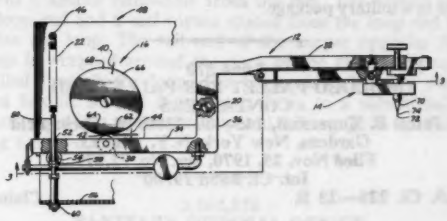


A cold, multiple upset butt welding machine having a simplified construction. The machine embodies two pairs of dies. One die of each pair is located against a stationary surface of a supporting frame arrangement and the other die of each pair is movable toward and away from the first die between an opened position and a gripping position. A first cam is associated with the other dies of the pairs for moving them between these positions. The pairs of dies are supported for movement toward and away from each other between a spaced position and a welding position. Second cam means are associated with the pair of dies for moving them between their spaced and welding positions. An operating handle has a pivotal connection to each of the cam means and is operative to move the first cam means and bring pairs of dies to their gripping position before the second means is operated and when the dies are in their spaced positions. After a wire is gripped by the closure of the pairs of dies, the second cam means moves the pairs of dies from their spaced positions to their welding positions. This achieves an upset in the wire ends. The procedure is repeated a number of times to achieve a multiple upset.

3,664,567
ARM ASSEMBLY FOR BONDING APPARATUS

Joseph L. Laub, Claremont, Calif., assignor to Unitek Corporation, Monrovia, Calif.

Filed June 27, 1969, Ser. No. 837,096
Int. Cl. B23k *21/00*
U.S. Cl. 228—3 8 Claims

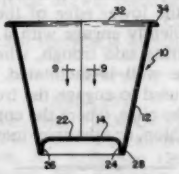


Apparatus for controlling the position and motion of a pivoted member. A pivoted bonding arm such as is provided in a bonding apparatus is biased into contact with a rotating cam during non-bonding intervals in the cycle of the bonding apparatus operation to limit the motion of the arm and overcome the inertial effects exerted on the arm due to the speed of apparatus operation.

3,664,568
INSULATED PLASTIC BUCKET

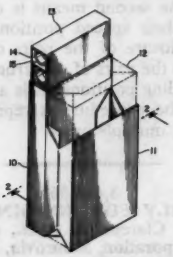
Gene D. MacDaniel, Lithonia, Ga., assignor to Sweetheart Plastics, Inc., Wilmington, Mass.

Filed Nov. 24, 1969, Ser. No. 879,448
Int. Cl. B65d *3/00*
U.S. Cl. 229—1.5 B 9 Claims



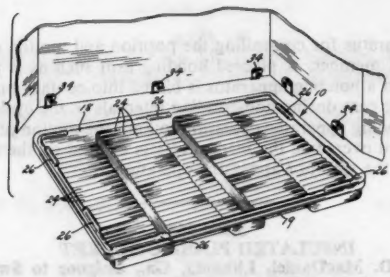
A container having a wrapped side wall of foam plastic sheet material with the side margins overlapped and welded together, and a separately formed bottom having a central portion generally perpendicular to the container axis and with an annular skirt extending away from the plane of the central portion and sealed to the lower margin of the side wall. A lid made of the same material fits over the upper margin of the container.

3,664,569
PACKAGING STRUCTURE
Mortimer Russell Dock, New York, N.Y., assignor to The H-2-O Filter Corporation, New York, N.Y.
Filed July 9, 1970, Ser. No. 53,396
Int. Cl. B65d *5/38, 85/10*
U.S. Cl. 229—10 3 Claims



This invention relates to packaging means for an article designed to be used with another commercially available type of article, and provides means for attachment of the two in a unitary package.

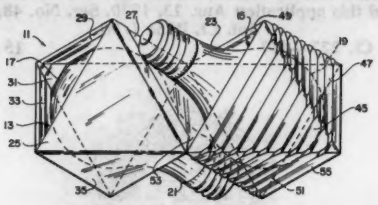
3,664,570
MOLDED PALLET FOR PALLETIZED CONTAINERS
Julius B. Kupersmit, 145—80 228th St., Springfield Gardens, New York, N.Y. 10013
Filed Nov. 25, 1970, Ser. No. 92,679
Int. Cl. B65d *19/06*
U.S. Cl. 229—23 R 2 Claims



A molded pallet for use in conjunction with palletized containers. The device includes an integrally molded peripheral trough engageable with the lower edges of fibrous or plywood panels forming the side walls of a container. Clips are provided which are semi-permanently interconnected to the lower edge of the side wall of the container, and resiliently engage with a bead on the edge of the pallet bordering said trough, whereby replacement of a damaged side wall is facilitated. Replaceable side walls may also be used to engage the trough on the pallet in the absence of the clips, where the container is strapped in conventional fashion, or otherwise integrated.

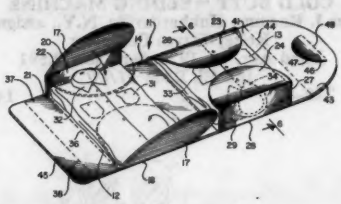
3,664,571
PACKAGE FOR LIGHT BULBS
Byron L. Lesar, University City, Mo. (7723 Blackberry, St. Louis, Mo. 63130)
Filed Oct. 29, 1970, Ser. No. 85,109
Int. Cl. B65d *71/00, 75/00*
U.S. Cl. 229—39 B 9 Claims

A package for a pair of light bulbs. The package is folded from a blank of chevron shape having a pointed and a notched end. A slit along the center line of the blank begins at the notched end and extends toward the pointed end. The blank is provided with first and second sets of score lines, lines in each set being parallel to edges of the blank defining the pointed end and thus angled with respect to the side edges of the blank. The sets of score lines intersect substantially at the slit, dividing the blank into alternate sets of triangular panels to provide two sets of triangular panels on each side of the slit. Each triangular panel of one set of panels on each side has its base along a side edge of the blank and its apex at the slit. Each triangular panel of the other set on each side



of the slit has its base along the slit and its apex at a side edge of the blank. Thus, when the sections of the blank are each folded along the score lines in opposite directions and corresponding edges of said first and second pairs are secured together, the package has a pair of compartments each having a plurality of peripheral triangular openings at opposite ends of the compartment through one of which openings the portion of a light bulb may be inserted and thereby confined within the compartment.

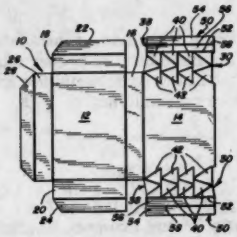
3,664,572
FOLDABLE SHIRT PACKAGING BOX AND CARRYING CONTAINER
Zalman P. Puchkoff, 1168 E. 86th St., Brooklyn, N.Y. 11236, and Vincent Topazio, 33 DeMartino Ave., Yonkers, N.Y. 10703
Filed Nov. 20, 1970, Ser. No. 91,281
Int. Cl. B65d *5/18*
U.S. Cl. 229—40 4 Claims



A foldable shirt packaging box and carrying container has been provided by this invention, and comprises two main panel portions interconnected by an intermediate riser portion and having end riser portions with a locking flap and locking latch that overlie one another, when the box has been folded up over shirt packages positioned upon the main panels, one shirt package extending in one direction with the collar lying at one end and with the other skirt package extending in the opposite direction with the collar lying at the other end of the panels, so that when the box is folded and the shirt package is joined the collars of the shirt package will be stacked oppositely. Flaps extend from the main panels and each of the main panel flaps have a plain flap foldable along one line and a double foldable flap, foldable upon two lines and providing for a riser portion overlying the collar of the packaged shirt. The different flaps of one panel extend oppositely from the flaps of the other panel. The locking latch of the locking flap is extendable through an elongated slot in the

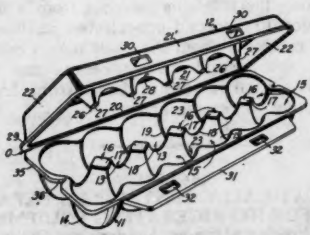
one panel and a handle is provided on one of the riser panels adjacent to the locking flap by which the package is carried. The elongated slot is closed on the inner face of the package by a closure plate providing for a pocket for receiving mainly the locking latch.

3,664,573
MAILING CONTAINER WITH CUSHIONING CELL CONSTRUCTION
James H. Partain, Norcross, Ga., and Richard H. Johnson, Arlington Heights, Ill., assignors to Stone Container Corporation, Chicago, Ill.
Continuation-in-part of application Ser. No. 50,447, June 29, 1970. This application Oct. 20, 1970, Ser. No. 82,316
Int. Cl. B65d 5/02
U.S. Cl. 229—40 5 Claims



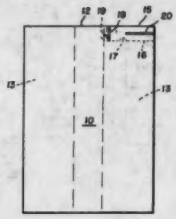
A single one-piece blank of paperboard or corrugated board capable of being folded into a mailer container having a pair of spaced apart parallel panels and an end cell cushioning construction connecting at least a pair of adjacent ends of the parallel panels. The portions of the blank which form each of the end cell cushioning constructions include a hinged flap of connected wall parts which cooperate to form an interior wall perpendicular to the said parallel panels and a wall parallel to said parallel panels and juxtaposed one of them having the book engaged thereagainst. Each end cell cushioning construction is located between said interior wall and an exterior wall of the mailer.

3,664,574
EGG CARTON
David L. Pearl, Atlanta, and John G. Waller, College Park, Ga., and Beverly P. Head, Jr., Birmingham, Ala., assignors to W. R. Grace & Co., Duncan, S.C.
Continuation-in-part of application Ser. No. 817,279, Apr. 15, 1969, which is a continuation-in-part of application Ser. No. 601,947, Dec. 15, 1966. This application June 29, 1970, Ser. No. 50,791
Int. Cl. B65d 1/24
U.S. Cl. 229—44 R 5 Claims



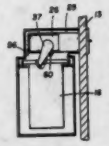
This invention relates to molded, foamed plastic egg cartons with elliptical cells which prevent the eggs stored therein from contacting each other. A locking flap pivotally attached along one edge of the carton includes locking lugs which mate with complementary apertures formed in the cover to firmly hold the cover in its closed position.

3,664,575
BAG CLOSURE
Connie Lake, 31 Kurt Road, Pittsford, N.Y. 14543
Filed Nov. 20, 1970, Ser. No. 91,262
Int. Cl. B65d 33/16
U.S. Cl. 229—62 15 Claims



A closure device for a plastic bag is formed of the plastic material of the bag itself during manufacture of the bag and is made by perforation and seal lines that form a keeper removable from the bag. The keeper has a loop end and a seal region spaced from the loop end to close the loop. The tail end of the keeper opposite the loop is wrapped around the neck of the closed bag and pulled through the loop. The keeper is sufficiently wide and flexible so that it is drawn down to a substantially narrower width where the loop and tail engage to hold the bag tightly closed.

3,664,576
SANITARY DISPOSAL DEVICE
Alfred M. Potvin, 81 Jalbert St., Thetford Mines, Quebec, Canada
Filed Nov. 5, 1969, Ser. No. 874,354
Claims priority, application Canada, Sept. 17, 1969, 62,209
Int. Cl. B65f 1/00
U.S. Cl. 232—43.2 6 Claims

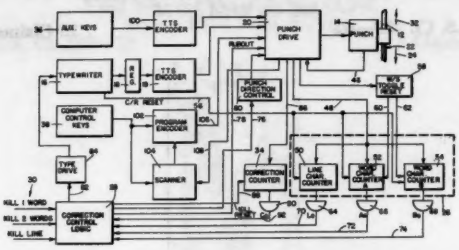


A sanitary disposal device comprising a trash receiving enclosure and a waste disposal drawer associated with the enclosure. The disposal drawer consists of a main drawer having a movable drawer therein to transport and release its contents in a trash receptacle located in the enclosure.

3,664,577
APPARATUS FOR THE PRODUCTION OF CODED INTELLIGENCE ON A RECORD MEDIUM
Frank G. Higgason, Jr., Arlington Heights, and Robert J. Sehnert, Palatine, Ill., assignors to Ludlow Typograph Company, Chicago, Ill.
Original application Apr. 21, 1969, Ser. No. 817,987, now Patent No. 3,580,494, dated May 25, 1971. Divided and this application Aug. 5, 1970, Ser. No. 61,344
Int. Cl. G06k 1/02
U.S. Cl. 234—15 1 Claim

Apparatus produces coded intelligence on a record medium, such as by perforating a moving tape, and has a keyboard input. An error correction capability is provided which utilizes the input data, itself, such as the word spaces, to control the operation of the system for

deletion of the unwanted data on the medium. A computer word program capability may also be provided for producing selected multi-character instruction codes on the medium from a single key at the keyboard.

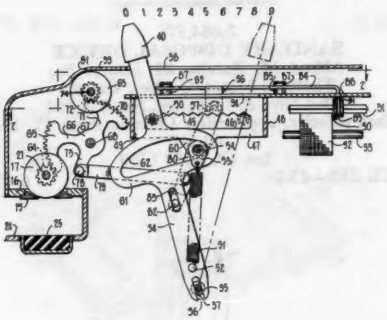


3,664,578

VALUE SELECTION SETTING MEANS

Harry F. Noller, Moraga, and John C. Morris, Castro Valley, Calif., assignors to The Singer Company, New York, N.Y.

Filed June 7, 1971, Ser. No. 150,322
Int. Cl. G07g *1/00*
U.S. Cl. 235—101 5 Claims



A value selection mechanism including ordinally arranged differentially settable levers pivotally supported on a common axis. Each lever is adjustable in a variable arc to selective positions representative of values "1" to "9" and "0." Upon adjustment of each lever, a corresponding check dial and type wheel are likewise adjusted to represent the selected value. At the same time, a corresponding gear means is adjusted to effect a registration of the selected value in one or more registers. As each lever is rocked about its axis, the manipulable end or exposed portion of each lever moves in a straight or planar path from one extreme angular position of the lever to the other.

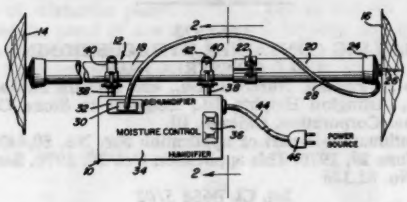
3,664,579

COMBINATION HUMIDISTAT AND HEATER

Allen M. Foote, Flat Rock, N.C.
(P.O. Box 1610, Hendersonville, N.C. 28739)

Filed Aug. 12, 1970, Ser. No. 63,484
Int. Cl. G05d *22/02*
U.S. Cl. 236—44 11 Claims

A humidistat for controlling moisture conditions in a piano, cigar case, or any other small enclosure where moisture control is necessary. The humidistat is combined with a heating device or a dehumidifier and a moisture producing device or humidifier and includes a housing attached to a heater or dehumidifier either by the use of a snap-on connection or a permanent installation to facilitate mounting of the humidistat in proper relation to the enclosed area and the heater or dehumidifier and the moisture producing device or humidifier.

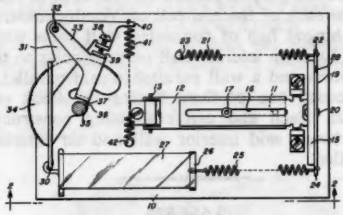


3,664,580

CHANGEOVER APPARATUS FOR A CONDITION RESPONSIVE DEVICE

Ronald L. Martin, Mount Prospect, Ill., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sept. 18, 1970, Ser. No. 73,398
Int. Cl. G05d *22/00*
U.S. Cl. 236—44 9 Claims



Apparatus for a pneumatic condition responsive device for facilitating the changeover from direct acting control to reverse acting control. A first biasing means including a condition responsive element and a second biasing means are connected to a rotatable member which is connected to a member pivotable about an axis to urge a flapper to variably restrict flow through a nozzle. Rotating the rotatable member from a first pre-selected position to a second pre-selected position causes a reversal of moments about the pivot means established by the first and second biasing means and thereby changes the condition responsive device from, for example, direct acting to reverse acting.

3,664,581

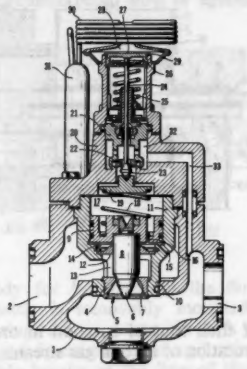
THERMOSTATICALLY CONTROLLED EXPANSION VALVE FOR REFRIGERATING EQUIPMENT

Jorgen Christian Stannow, Sonderborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

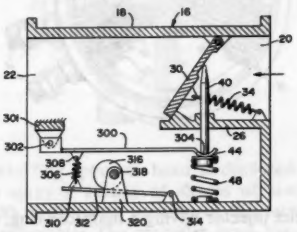
Continuation of application Ser. No. 821,816, May 5, 1969. This application Feb. 9, 1971, Ser. No. 114,041
Int. Cl. F25b *41/04*
U.S. Cl. 236—80 6 Claims

The invention relates to a thermostatically controlled valve assembly for high capacity refrigeration equipment.

The valving includes main and auxiliary valves with the auxiliary valve functioning as a pilot valve. In the operation the main valve may occupy any intermediate position between fully opened and fully closed positions.



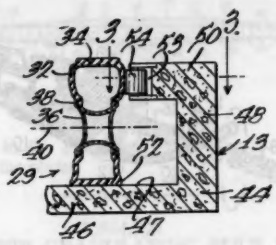
3,664,582
NON-LINEAR TEMPERATURE RESPONSIVE VALVE ASSEMBLIES
Wilbur F. Jackson, Rolling Hills, and James R. Willson, Garden Grove, Calif., assignors to Robertshaw Controls Company, Richmond, Va.
Filed Oct. 29, 1969, Ser. No. 872,088
Int. Cl. G05d *23/02*
U.S. Cl. 236—93 **20 Claims**



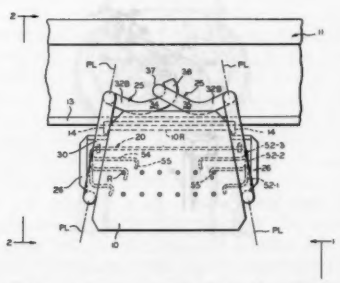
A temperature responsive valve assembly including an inlet, an outlet and a valve member mounted therebetween and adapted to be positioned by an operator member constructed of a material having a temperature-actuated shape memory. The operator member is located adjacent the downstream side of the valve assembly whereby fluid flow therethrough is regulated in relation to downstream fluid temperature. The particular actuating temperature of the operator member can be fixed or can be adjusted as by varying the stress applied thereto by springs.

3,664,583
VEHICLE TRACKWAY
Dillis V. Allen, 208 Euclid Ave., Arlington Heights, Ill. 60004
Filed Apr. 25, 1969, Ser. No. 819,211
Int. Cl. E01f *15/00*
U.S. Cl. 238—5 **3 Claims**

A track for an inflatable rubber tired vehicle having a plurality of rollers mounted for rotation about a vertical axis and engageable with the rubber sides of the tires above the axis of rotation of the tires to reduce the axial and vertical friction between the tire and the track along the sides of the tire to a minimum.



3,664,584
CONCRETE TIES
Raymond J. Novotny, Sparta, assignor to Abex Corporation, New York, N.Y.
Filed Feb. 9, 1970, Ser. No. 9,852
Int. Cl. E01b *9/30*
U.S. Cl. 238—349 **3 Claims**



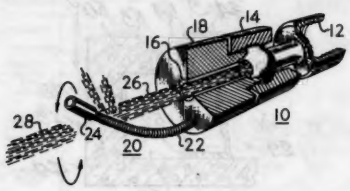
A concrete tie is provided with protuberances on opposite sides thereof serving to anchor a pair of one-piece spring-type rail fasteners. Each fastener has a bight tensioned on the protuberance, and a pair of legs extend upward from the bight. The upper ends of the legs are bent to afford extensions which overlie the base of the rail, and bends therein engage the base of the rail with a spring force. The free ends of the fasteners end in hooks, one hook being the complement of the other so that a pair of such fasteners may be complementally jointed at the free ends and tensioned one on the other.

The protuberances of the tie are under a great deal of compression and are reinforced by bends in a plurality of rod-like stringers embedded in the tie to extend between the protuberances.

3,664,585
THERAPEUTIC SHOWER HEAD
Daniel L. Curtis, 1956 Ardmore Ave., Manhattan Beach, Calif. 90266
Filed Dec. 18, 1970, Ser. No. 99,410
Int. Cl. B05b *3/04*
U.S. Cl. 239—222.21 **1 Claim**

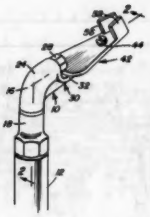
A therapeutic shower head is disclosed which includes a collimator for producing a single beam of water. A

swivel arrangement is provided to allow the direction of the beam to be altered. A beam interrupter is provided at the output that pulsates the beam. The interrupter can either be dormant or if set into motion will derive energy



from the beam and begin a sustained oscillation that will periodically interrupt the beam. The therapeutic benefits of the shower head are derived from both the single steady beam and from the pulsating beam.

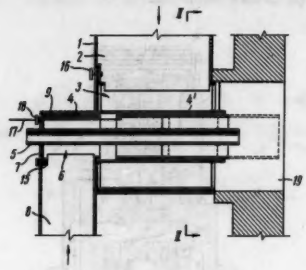
3,664,586
SPRINKLER HEAD
Charles R. Harris, Sr., 4671 E. Michigan, Fresno, Calif. 93703
Filed July 6, 1970, Ser. No. 52,258
Int. Cl. B05b *3/08*
U.S. Cl. 239—233 **13 Claims**



A tubular body including relatively angulated tubular legs joined at one pair of adjacent ends with their interiors communicated with each other. A rotary coupling member is carried by the free end of one leg for rotary connection with the outlet end of an associated water supply pipe and the free end of the other leg includes means defining a water jet outlet nozzle for endwise outwardly directing a discharge of water therefrom. The free end of the other leg further includes water jet deflecting panel structure supported from the other leg for adjustable registry with and inclination relative to the path of the jet of water from the nozzle.

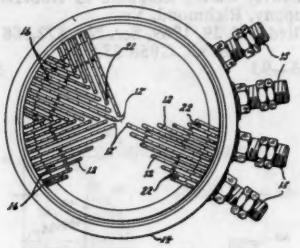
3,664,587
BURNER DEVICE FOR COMBUSTION GASES
Rustan Berovich Akhmedov, Massiv Cherdantseva 2, kv. 6; Zakhidzhan Sadykdzhanovich Talibdzhanov, Ulitsa Bokserskaya 57; Asomkhodzha Valikhodzhaev, Ulitsa Pavlenko 6; and Faizulla Karimovich Rashidov, Massiv Chilanzar 9–G kvartal 39, kv. 30, all of Tashkent, U.S.S.R.
Filed Jan. 22, 1970, Ser. No. 4,955
Int. Cl. B05b *7/10*
U.S. Cl. 239—402.5 **5 Claims**

A burner device for combustion gases, for use in boiler units. In said burner device, there are whirlers for air and gas, which are shaped as rotary pieces permitting, variation of the place of admission of gas and air streams as well as of the cross-section of the channel at the place of admission, said rotary pieces being provided with the



possibility of their mutual rotation in order to vary the direction of rotation of air and gas streams.

3,664,588
PLATELET INJECTOR
James H. Mitchell, Rancho Cordova, and Hans H. Mueggenburg, Diamond Springs, Calif., assignors to the United States of America as represented by the Secretary of the Air Force
Filed Oct. 22, 1969, Ser. No. 868,980
Int. Cl. F23d *11/10*
U.S. Cl. 239—418 **1 Claim**

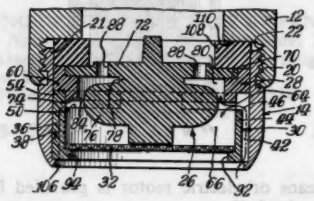


A platelet injector having a manifold ring, and a plurality of vanes arranged in groups of vanes secured to said manifold. Each groups of vanes having a radially extending vane, with the remaining vanes of that group parallel thereto. The vanes of each group being a constant width apart forming a passage therebetween. In operation the fuel is injected from said vanes while the oxidizer passes through said passage between said vanes.

3,664,589
AERATING DEVICE
George W. Jatho, Oak Lawn, and Louis F. Kint, Chicago, Ill., assignors to Wrightway Engineering Co., Chicago, Ill.
Continuation of application Ser. No. 709,992, Mar. 4, 1968. This application May 11, 1970, Ser. No. 56,038
Int. Cl. E03c *1/084*
U.S. Cl. 239—428.5 **13 Claims**

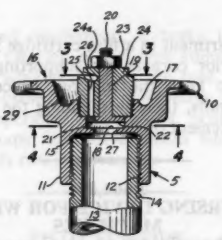
Disclosed herein is an aerating device for entraining air in water or other liquid flowing through a conduit. The aerating device includes a casing with a removable internal assembly comprising an annular partition mounted in the casing and having radially projecting and axially extending ribs which form air inlet passages between

a smooth inner surface of the casing and the partition. The ribs extend axially above an upstream end portion of the partition to form legs which removably support a seating ring in spaced relation above the partition to thereby define circumferential slots or apertures between



the legs. A body for breaking up the flow of liquid through the casing is removably mounted on a seat formed in the ring. Air is drawn through the passages and apertures and is entrained in and mixed with the liquid as the body breaks up the flow of liquid.

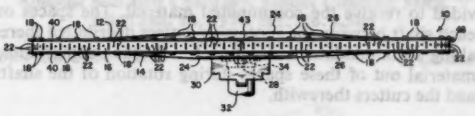
3,664,590
LAWN SPRINKLER WITH PATTERN CONTROL MEANS
William J. Knight, 1102 Fairview, Arcadia, Calif. 91006
Filed June 12, 1970, Ser. No. 45,700
Int. Cl. B05b *1/26*
U.S. Cl. 239—499 **3 Claims**



A lawn sprinkling spout or head is disclosed which is adjustable to spray a variety of shapes of lawn sectors selectively with water. The position of the sector of the lawn is also selectable. The sprinkler head has a plurality of outlet apertures arranged in a uniform distribution. Over these apertures a movable mask is operably located. The mask has a plurality of notches or apertures arranged in a predetermined pattern so that particular combinations of the apertures of the mask may be positioned in the path of predetermined groups of the outlet apertures to permit communication between a water source and the predetermined pattern of outlets which are in position over the mask. The remaining outlets are blocked. As a result a selectable lawn spray pattern is achieved.

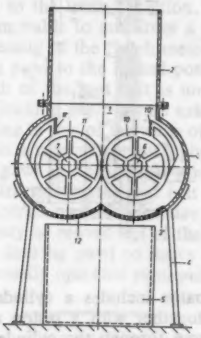
3,664,591
BURNER
Charles E. Stohrer, Jr., Hickory Hills, and Bissell J. Smith, Oak Brook, Ill., assignors to Harper-Wyman Company, Hinsdale, Ill.
Filed Aug. 19, 1970, Ser. No. 65,151
Int. Cl. B05b *1/14*
U.S. Cl. 239—552 **6 Claims**

A gas burner includes stamped sheet metal top and bottom plates of similar configuration and capable of being formed with a single die. The plate edges are spaced apart to form a gap receiving a metal strip including burner ports and including projecting tabs extending



through slots in the plates and bent over to clamp the strip between the plates.

3,664,592
MACHINE FOR GRANULATING BULK RUBBISH OR BULKY REFUSE OF ANY KIND
Luitpold Schweigert, Lieneschurez 34, Osnabruck, Germany, and Kurt Rossler, Ringstrasse 28, Belm-Osnabruck, Germany
Filed Sept. 3, 1969, Ser. No. 854,821
Claims priority, application Germany, Sept. 3, 1968, P 17 58 913.8
Int. Cl. B02c *18/14, 18/20*
U.S. Cl. 241—73 **7 Claims**



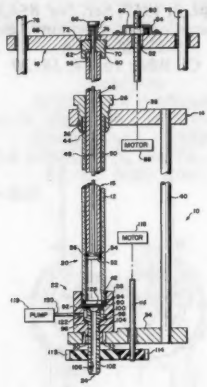
A machine for comminuting bulky refuse of any kind. The machine includes a pair of rotary shafts which are parallel to each other and which are adapted to rotate in opposite directions. Each shaft has distributed therealong a plurality of rotary cutters fixed to the shaft for rotation therewith with the rotary cutters being spaced from each other along the shaft and with each cutter having a single tooth, the teeth of the cutters distributed along each shaft being angularly staggered about the axis of each shaft. The cutters on one shaft are aligned with the spaces between the cutters on the other shaft, and each cutter has a circular portion fixed to the shaft and the single tooth of each cutter projects beyond the circular portion of each cutter. These circular portions of the cutters on the pair of shafts have peripheries situated closely adjacent to each other so that the single cutting teeth on the several cutters of one shaft move through the spaces between the circular portions of the cutters on the other shaft. The rotary shafts with the cutters thereon are housed within a trough-shaped housing carrying an upper inlet through which material is supplied to the cutters, this housing having a lower outlet situated beneath the rotary cutters at a location adjacent to the space through which the teeth of the cutters turn during rotation of the shafts. This lower outlet of the housing carries a structure which prevents the comminuted material from passing through the outlet until this material has been reduced to a given size, and the cutting teeth function not

only to comminute the material but also to repeatedly raise it from the outlet and repeatedly act on the material until it has been reduced to the size required to pass through the outlet where a suitable collector can be provided to receive the comminuted material. The spaces on each shaft between the successive cutters distributed therealong accommodates a structure for cleaning comminuted material out of these spaces during rotation of the shafts and the cutters therewith.

3,664,593
GEL FRACTIONATOR

Warren E. Gilson, 4801 Sheboygan Ave., and Robert E. Gilson, 4 Franklin Ave., both of Madison, Wis. 53705

Filed Apr. 1, 1970, Ser. No. 24,640
Int. Cl. B02c *19/00*
U.S. Cl. 241—60 **10 Claims**



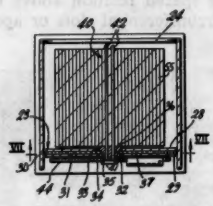
A gel fractionator includes a cylinder for holding a column of gel, together with a piston assembly for advancing the column through the cylinder toward a fractionating apparatus. The piston assembly includes an air release valve operable from the exterior of the cylinder for releasing trapped air from above the gel column. The fractionating assembly includes a cutting screen engaged by the advancing column for severing the advancing column in a generally axial direction into subdivisions or segments. A rotating wire beneath the screen severs the subdivisions of gel as the gel advances. The wire is mounted across the mouth of a funnel which receives the severed gel particles, and the funnel includes structure for directing a stream of liquid at the underside of the screen for flushing the severed particles. The fractionating operation is carried out by repeatedly advancing the column a predetermined distance, pausing, and carrying out several discrete flushing operations to remove all severed particles.

3,664,594
BANDAGE ROLL-UP PACKAGING DEVICE

Steve Novak, Rte. 2, Box 299, Battle Creek, Mich. 49017

Filed Sept. 8, 1970, Ser. No. 70,432
Int. Cl. B65h *17/02, 75/02*
U.S. Cl. 242—60 **10 Claims**

A container for storing and transporting rolled continuous webs or strips such as bandages is provided, including a device therein for rerolling the webs or strips for storage after use. The device comprises a spindle having one end mounted in a hub, the hub being rotatably mounted at a wall of the container, and having means engaging and restraining the hub against the axial and angular movement with respect to the container wall. A

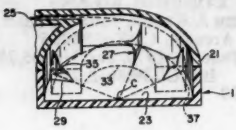


crank means or electric motor is provided for rotating the hub and spindle.

3,664,595
FILM CARTRIDGE

Hubert Nerwin, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 8, 1970, Ser. No. 96,101
Int. Cl. G03b *1/04*
U.S. Cl. 242—71.1 **10 Claims**

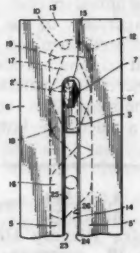


A film compartment in a film cartridge is provided with fins at its interior corners for supporting a roll of film by its edges to keep the roll out of contact with the compartment walls, thereby reducing the frictional force resisting displacement of the film.

3,664,596
TRAVERSING DEVICE FOR WINDING MACHINES

Erich Lenk, Remscheid-Lennep, Germany, assignor to Barmag Barmer Maschinenfabrik Aktiengesellschaft, Wuppertal, Germany

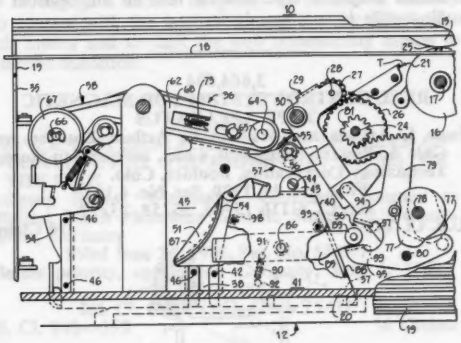
Filed Jan. 8, 1970, Ser. No. 1,342
Claims priority, application Germany, Jan. 11, 1969, P 19 01 305.9
Int. Cl. B65h *54/30*
U.S. Cl. 242—43 **3 Claims**



Traversing device for moving a thread, wire, etc. back and forth in spooling machines, wherein the thread guiding traverse element has an arcuately elongated shoe adapted to ride the spiral grooves of a rotatable roller and a platelet form slide plate which is guided between

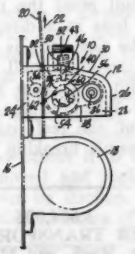
two rails running in traverse direction, characterized in that the platelet form slide piece, in a manner known in itself, engages in two parallel guide grooves running in traverse direction and is swingable in these about its vertical axis.

3,664,597
BRAKING DEVICE FOR A TAPE DISPENSER
Melvin H. Norman, Oakland, and Nathaniel F. Hawthorne, Alameda, Calif., assignors to The Singer Company, New York, N.Y.
Filed May 11, 1970, Ser. No. 36,330
Int. Cl. B65h *23/06*
U.S. Cl. 242—75.4 3 Claims



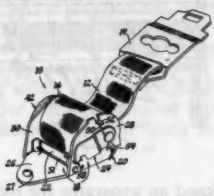
In a tape feed mechanism, a brake is provided for terminating the rotation of the tape supply roll immediately following advancement of the tape. Normally, the brake is spring-biased to an inoperative position and is moved to the operative, or braking, position under the control of the tape feed drive means whereby overrunning of the supply roll is prevented.

3,664,598
PILOT SUPPORT
Gale K. Sherman, Tustin, Calif., assignor to McDonnell Douglas Corporation, Santa Monica, Calif.
Filed July 31, 1970, Ser. No. 59,883
Int. Cl. A62b *35/00*
U.S. Cl. 242—107.3 6 Claims



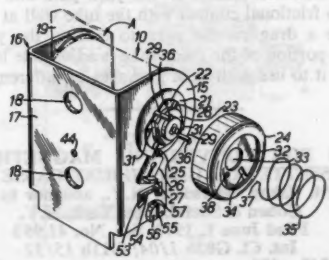
An attachment providing drag on a shoulder harness strap sufficient to prevent an unconscious torso from slumping forward, yet not enough drag to prevent a conscious pilot from achieving normal reach. In one embodiment a friction clutch on an inertia reel is used and in another a friction clutch unit is positioned between the inertia reel and the occupant.

3,664,599
DOUBLE LOCKING RETRACTABLE SEAT BELT ASSEMBLY
Gerald J. Partridge, Roseville, Mich., assignor to Jim Robbins Seat Belt Company, Mount Clemens, Mich.
Filed Jan. 13, 1970, Ser. No. 2,565
Int. Cl. A62b *35/00*
U.S. Cl. 242—107.4 5 Claims



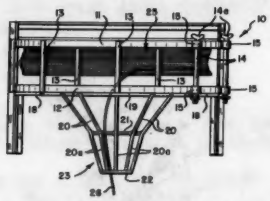
A retractable seat belt assembly including a U-shaped support bracket rotatably supporting a reel means from which the seat belt is protracted and retracted by being unwound and wound thereabout. A locking pawl is supported by the bracket for movement to and from a locking position for preventing rotation of the reel means in the unwinding direction. A clutch member engages the locking pawl and is rotated by the reel means for moving the locking pawl to the locked position. A cam operated stop member is movable to and from a position for preventing the movement of the clutch member which would move the locking pawl to the locked position until a predetermined length of the seat belt is unwound from the reel means. The locking pawl has an extension extending through an opening in one of the walls of the bracket and which coacts with a recess in a latch plate for maintaining the locking pawl in the locked position to prevent protraction or retraction of the seat belt in response to a predetermined protraction and retraction of the seat belt. The latch plate may be moved out of the latched position for allowing the locking pawl to move to the unlocked position by a manually operated push-pull remote control assembly.

3,664,600
INERTIA REELS FOR SAFETY BELTS
Archibald Sargeant, Bognor Regis, England, assignor to Wingard Limited, Chichester, Sussex, England
Filed Sept. 11, 1969, Ser. No. 857,172
Claims priority, application Great Britain, Sept. 12, 1968, 43,357/68
Int. Cl. A62b *35/00*
U.S. Cl. 242—107.4 5 Claims



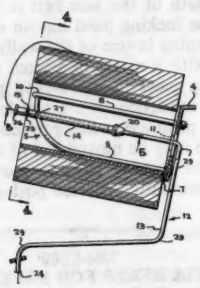
A spring-loaded reel for a vehicle safety belt incorporates an inertia member which is sensitive to a lateral tilt on lateral acceleration of the vehicle and activates a pawl and ratchet mechanism for temporarily locking the reel. A pivoted block permanently jams the inertia member in the locked position when the vehicle tilt exceeds a predetermined value.

3,664,601
WIRE PAY-OFF APPARATUS
James H. Richardson, Jr., Littleton, Colo., assignor to CF & I Steel Corporation, Denver, Colo.
Filed June 1, 1970, Ser. No. 42,211
Int. Cl. B65h *49/00*
U.S. Cl. 242—129 4 Claims



There is disclosed an apparatus for receiving and holding a coiled and tempered wire in a vertical position, the apparatus securely holding the coiled wire while permitting paying out of the wire from the coil horizontally without coil rotation.

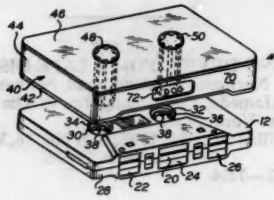
3,664,602
CREEL WITH TUBULAR YARN GUIDE
Kazimer Renzi, 7601 Fawndale Drive, Chesterfield, Va. 23832
Filed Aug. 25, 1970, Ser. No. 66,730
Int. Cl. B65h *49/02;* D02h *1/100;* D03j *5/08*
U.S. Cl. 242—131 7 Claims



A bucketless yarn creel, or carrier, for holding yarn packages and guiding the yarn during withdrawal from the packages wherein each package is mounted on a holder which has a yarn guide tube with an entrance portion extending axially of the holder and of a package on the holder. The guide tube has one or more bends to create a direction change in the yarn path and bring the yarn into frictional contact with the tube wall at the bend, to create a drag on the yarn to tension the yarn. The entrance portion of the guide tube is adjustable lengthwise to adapt it to use with yarn packages of different size.

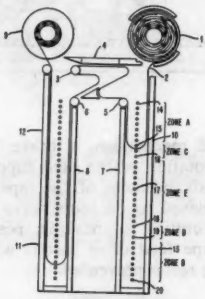
3,664,603
MEANS FOR CONVERTING MAGNETIC TAPE CASSETTE TO AUDIO-VISUAL CASSETTE
Marion M. Eskay, Scarsdale, N.Y., assignor to Hubbell, Cohen & Stiefel, New York, N.Y.
Filed June 1, 1970, Ser. No. 41,993
Int. Cl. G03b *1/04;* G11b *15/32*
U.S. Cl. 242—180 17 Claims

An attachment for a standard magnetic tape cassette (and the composite product resulting therefrom) which attachment includes a pair of rotatable splined shafts connectable with the toothed hubs of the spools of the standard tape cassette for rotation therewith, the splined shafts having a pair of spools thereon with an indicia bearing tape extending therebetween. Guide means are also included for guiding the indicia bearing tape from one spool to the other. The indicia bearing tape may be provided with visual indicia such as lettering, or with



tactile indicia such as for braille, whereby to convert a standard magnetic tape cassette into an audio-visual or audio-tactile instruction device.

3,664,604
REEL CONTROL SYSTEM FOR MAGNETIC TAPE APPARATUS
Jesse I. Aweida and William C. Arthur, Boulder, and Gale A. Powers, Longmont, Colo., assignors to Storage Technology Corporation, Boulder, Colo.
Filed Jan. 27, 1970, Ser. No. 6,181
Int. Cl. G11b *15/06, 15/58, 23/12*
U.S. Cl. 242—185 10 Claims

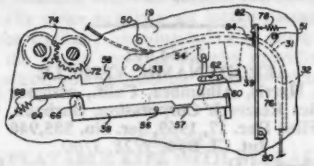


In magnetic tape handling apparatus, diaphragm operated switches in the slack tape vacuum column are connected to produce a continuous error signal applied to the reel motor. When the capstan drive is in a direction taking tape out of the column, the tape loop is positioned about an upper null point. When the tape loop moves above this upper null point, an error signal, linear with loop position, is applied to drive the reel motor. In a zone below the upper null point the reel coasts. When the capstan drives the tape in a direction which puts tape into the column, the tape loop is positioned at a lower null point. Below the lower null point an error signal which is linear with tape loop position is applied to drive the reel motor. When the tape loop is in a zone above the lower null point, the reel coasts. Between the two coasting zones, dynamic breaking is applied to the reel motor.

3,664,605
REVERSIBLE WEB TRANSPORTING APPARATUS
Donald O. Easterly, Rush, and Morris E. Brown, Fairport, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Nov. 23, 1970, Ser. No. 91,698
Int. Cl. G03b *1/04;* B65h *25/00*
U.S. Cl. 242—189 10 Claims

A web-handling apparatus having means selectively shiftable between a first condition for transporting a web from a supply roll, through an operating station to a web take-up and a second condition for transporting the

web from the take-up through the operating station onto the supply roll. Movable means are provided for shifting the transporting means between its first and second conditions. The movable means is releasably latched in its first condition against a biasing force. Means responsive



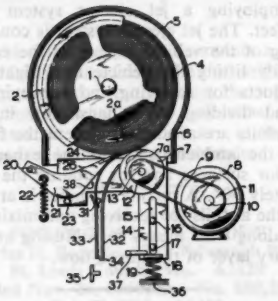
to an increase in web tension causes a latch release member to engage a source of power to be moved thereby into contact with the latch means to thereby release the latch means and to shift the web transporting means to its second condition.

3,664,606

DEVICE FOR DEFLECTING THE LEADERS OF CONVOLUTED PHOTOGRAPHIC FILMS OR THE LIKE

Wolfgang Riedel, Winnenden, Germany, assignor to Robert Bosch Photokino GmbH., Stuttgart-Untertürkheim, Germany

Filed June 26, 1970, Ser. No. 50,097
Claims priority, application Germany, July 1, 1969, P 19 33 288.8
Int. Cl. G03b *1/04;* G11b *15/32*
U.S. Cl. 242—192 **10 Claims**



A deflecting device for directing the leader of convoluted photographic film into a channel in a cinematographic apparatus wherein a friction wheel serves to rotate the film supply reel in a direction to unwind the film. The deflecting device has a lever whose pallet supports a detachable springy metallic blade. The lever is pivotable by the carriage for the friction wheel to move the blade against the outermost convolution of film on the rotating supply reel whereby the blade deflects the leader of the outermost convolution away from the nearest convolution and causes it to enter the channel. The blade can be removed and replaced by the user and is held on the lever by friction. The thickness of the blade is less than the thickness of the film.

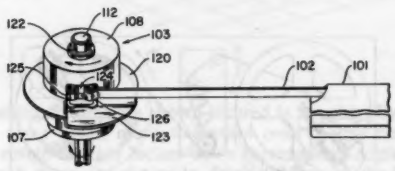
3,664,607

DUAL TAKE-UP REEL

Edwin W. Trefzger, Ilion, and Bruce Crimmins, Little Falls, N.Y., assignors to The Singer Company

Filed Mar. 23, 1970, Ser. No. 21,565
Int. Cl. G11b *15/66;* B65h *75/28*
U.S. Cl. 242—195 **3 Claims**

A take-up reel having inner and outer concentric hubs for the temporary storage of tape, such as magnetic tape, from a supply reel is disclosed. Typically the tape will include a leader tape associated with both the take-up reel and the supply reel with the tapes coupled together by means of a leader hook. The leader tape of the take-up reel is wound on the inner hub of the take-up reel while the leader tape of the supply reel and the information bearing tape from the supply reel are wound on the outer hub of the take-up reel. The inner and outer hubs are arranged for coaxial but independent rotation. The outer hub has a cutaway portion which provides an aperture into which the leader hook coupling the leader tape of the take-up reel and the leader tape of the supply reel is lodged. When the leader hook is lodged in the aperture, the inner and outer hubs are coupled together for coincident rotation. Since the leader hook is lodged in the



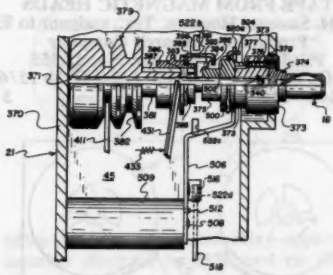
aperture, the information bearing tape from the supply reel, which is wound on the outer hub of the take-up reel, is not stretched nor distorted as it is wound on the outer hub of the take-up reel. Driving power for turning the take-up reel is applied to the inner hub. When the leader hook is lodged in the aperture, the inner and outer hubs are coupled together so that the inner and outer hubs rotate at the same angular velocity. In a similar manner when the tape is being rewound on the supply reel, the leader hook maintains the coupling between the inner and outer hubs of the take-up reel thereby maintaining their rotation at the same angular velocity. However, as soon as the leader hook is withdrawn from the aperture, the outer hub ceases to rotate and only the inner hub is rotated.

3,664,608

CINEMATOGRAPHIC PROJECTOR HAVING A FILM SUPPLY SPINDLE ASSEMBLY

Donald O. Easterly and Raymond E. Olcott, Rush, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

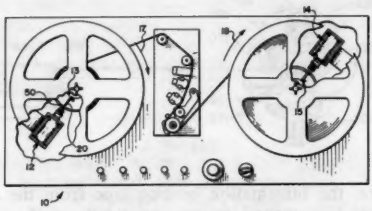
Filed May 6, 1970, Ser. No. 34,959
Int. Cl. B65h *23/08;* G03b *1/04*
U.S. Cl. 242—204 **7 Claims**



A cartridge loading motion picture projector has a film supply spindle assembly that is adapted to support a film reel positioned within a cartridge on the projector or to support an unenclosed reel of film or the like. The spindle is substantially "free wheeling" when the projector is in the cartridge mode of operation to insure reliable threading of film from the cartridge to automatic threading

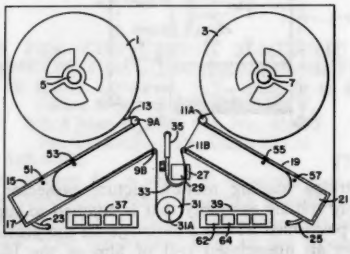
devices of the projector. On the other hand, when the projector is adjusted to its reel mode of operation a frictional force is automatically applied to the spindle assembly to prevent such free wheeling and thereby substantially to prevent over travel of the reel when (for example), the projector is shifted from forward projection of film to projection of a simple frame of film, thereby minimizing the possibility of "spilling" film from the reel.

3,664,609
TAPE RECORDER BRAKE ASSEMBLY
Grant L. McMillin, Jr., Racine, Wis., assignor to Webster Electric Company, Inc., Racine, Wis.
Filed May 25, 1970, Ser. No. 40,096
Int. Cl. B11b *15/32*; G03b *1/04*
U.S. Cl. 242—204 **10 Claims**



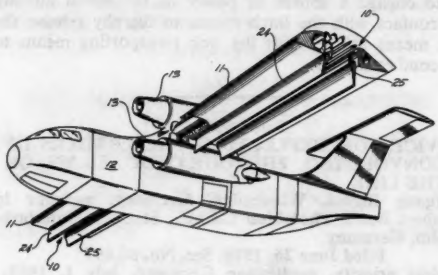
A tape recorder brake assembly stops the tape takeup and supply reels quickly and without tape breakage or spillage in the event of a power failure during high speed tape handling operations. Each reel is provided with a brake mechanism including a solenoid normally energized to overcome a spring force and to withdraw a brake shoe from the reel drive shaft. The brake shoe is supported on an arm fastened to a slot in the solenoid armature by a resilient coupling. When the solenoid is deenergized, as upon a power failure, the brake shoe is applied to the shaft by the spring. The arm extends through a slot which acts as a fulcrum or pivot point for the arm. The slot, arm and shoe are arranged so that if the reel is moving in the supply direction the braking force is greater than if the reel is moving in the takeup direction. The braking force developed is sufficiently large to bring the reels quickly to a halt, but the braking force differential between the two reels is not great enough to stretch or break the tape.

3,664,610
AUTOMATIC SYSTEM FOR LIFTING MAGNETIC TAPE FROM MAGNETIC HEADS
John H. Sasseen, Houston, Tex., assignor to Esso Production Research Company
Filed July 6, 1970, Ser. No. 52,355
Int. Cl. B65h *75/34*; G03b *1/04*; G11b *15/60*
U.S. Cl. 242—210 **3 Claims**



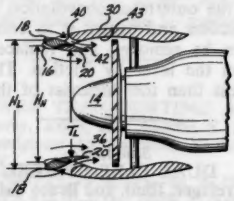
Magnetic tape transport apparatus for use with digital computers and recorders use tape tension control devices in conjunction with the speed control mechanism controlling speed and direction of the tape transfer between a storage reel and a "take-up" reel. The wear rate of the magnetic head used for recording and/or reproducing data signals is minimized by directing a stream of compressed air between the head and the tape.

3,664,611
AERODYNAMIC VEHICLE
Gordon L. Harris, Alhambra, Calif., assignor to Flight Dynamics Research Corporation, Burbank, Calif.
Filed Dec. 17, 1969, Ser. No. 885,940
Int. Cl. B64c *3/28, 3/00*
U.S. Cl. 244—42 CD **10 Claims**



An aerodynamic vehicle capable of vertical take off and landing employing a jet ejector system utilizing the Coanda effect. The jet ejector system is constructed within the wing of the vehicle to receive the engine exhaust for vertically lifting the vehicle into flight. The ejector has fluid ducts for receiving and conveying the engine exhaust and dividing the exhaust flow into jet sheets. Coanda airfoils are arranged adjacent the fluid ducts for entraining the ambient air into the exhaust flow over their exterior surfaces and for rotating the flow through approximately 90°. A mixing chamber is arranged downstream of the airfoils for receiving and mixing the rotated jet sheets along with means for diffusing and controlling the boundary layer of the mixed flow.

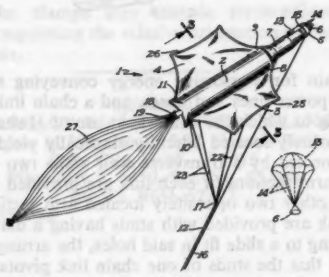
3,664,612
AIRCRAFT ENGINE VARIABLE HIGHLIGHT INLET
Wallace E. Skidmore, Redmond, Bjarne E. Syltebo, Bellevue, and Wilton S. Viall, Des Moines, Wash., assignors to The Boeing Company, Seattle, Wash.
Filed Dec. 22, 1969, Ser. No. 887,181
Int. Cl. F02b *27/02*; F02k *11/00*; B64d *29/00*
U.S. Cl. 244—53 B **4 Claims**



An aircraft jet engine leading edge double foil structure comprising a pivotally mounted exterior foil which forms the leading edge contour and exterior cowl fairing in a

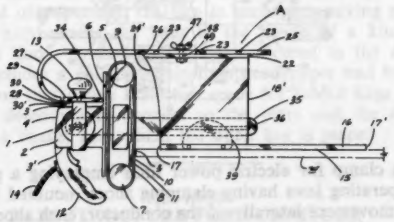
closed position during high-speed flight and which is responsive to aerodynamic pressures to pivot to expand the leading edge diameter or highlight during take-off or low-speed flight. A pivotally mounted interior foil acts as an internal cowling fairing for high-speed flight and pivots to combine with said exterior foil to form an aerodynamically clean auxiliary air intake passageway which directs the auxiliary air longitudinally along the interior wall of the intake cowling, thereby providing boundary layer control and decreasing pressure recovery losses.

3,664,613
INFLATABLE KITE WITH RELEASABLE ACCESSORY
Orin B. Johnston, 5548 W. 78th St., Minneapolis, Minn. 55435
Filed Nov. 25, 1970, Ser. No. 92,641
Int. Cl. A63h *27/08*
U.S. Cl. 244—155 R **6 Claims**



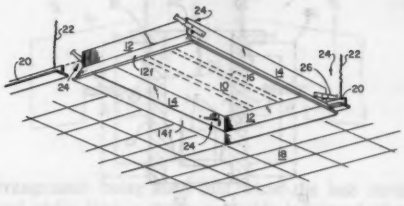
An inflatable kite, designed to simulate a rocket. The kite has a variable dihedral angle for self-stabilization. An accessory nose cone, mounted on the top of the kite with a parachute attached to the nose cone, is releasable by the operator so that it parachutes to the ground to simulate a space vehicle command module.

3,664,614
POWER TOOL ACCESSORY
Charles H. Baechle, 7701 Telegraph Road, St. Louis County, Mo. 63129
Filed Nov. 26, 1969, Ser. No. 880,289
Int. Cl. F16m *11/00*
U.S. Cl. 248—2 **10 Claims**



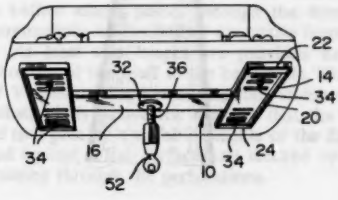
An accessory for a portable power tool, such as a sander, for supporting same with relation to the work and for presenting same at the preselected angle thereto, said accessory comprising a base plate for disposition upon the upper surface of the work, an arm adjustable longitudinally of said accessory and having a handle, a leg pivotally mounted on said handle and being engageable to said tool whereby a tool may be swung with relationship to the work and a bar for maintaining said tool in selected position.

3,664,615
CEILING FIXTURE SUPPORT
Michael H. Kruger, Chestnut Hill, Mass., assignor to Smithcraft Corporation, Wilmington, Mass.
Filed Aug. 21, 1969, Ser. No. 851,950
Int. Cl. H05k *5/00*
U.S. Cl. 248—27 **10 Claims**



Ceiling fixtures are shown secured in openings by slideable arms which move to project over ceiling members and rotate and are locked down thereagainst. A plurality of such arms are shown to draw a flange of the fixture upwardly to align with or press against the ceiling as the arms press down on the ceiling member. The slideable movement is shown achieved by matching pin and elongated slot, with the arm rotating about the pin in the projected position. Guidance of the arm is achieved by a member which follows a guide that curves downwardly in the region corresponding to the projected position of the arm. A projection is shown serving as a handle and defines the locking surface engageable by the locking member, while the locking member is shown as a cam. All parts can be simply formed out of sheet metal and occupy little space in the retracted position.

3,664,616
OFFICE MACHINE ANTITHEFT LOCKING APPARATUS
Archie Raskin, Engelwood, N.J., assignor to Componentry Research and Development Enterprises, Inc., Great Neck, N.Y.
Filed Sept. 21, 1970, Ser. No. 73,881
Int. Cl. E05b *73/00*
U.S. Cl. 248—25 **6 Claims**

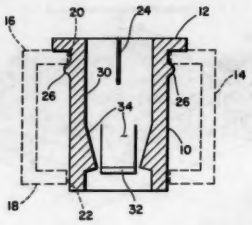


An office machine antitheft locking apparatus including a member designed to be placed on the top of a furniture surface. The member includes means for selectively securing a plurality of bolts to which the office machine may be secured. A fastening device projects away from said member and is adapted to extend through a furniture surface and means are provided for securing said fastening device when it extends through the surface. The device is designed so that when an office machine is secured to the bolts there is no access to the bolts.

3,664,617
SIGN MOUNTING SOCKET

Jay G. Fenwick, Albert Lea, Minn., assignor to Streater Industries, Inc., Albert Lea, Minn.

Continuation of application Ser. No. 735,454, June 7, 1968. This application Mar. 9, 1970, Ser. No. 17,029
Int. Cl. E04h 12/22
U.S. Cl. 248—38 1 Claim



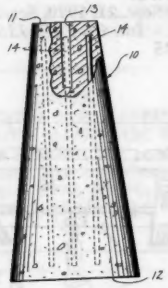
The invention relates generally to signs used in retail merchandising stores such as department stores, and in particular, to the mounting of such signs on display cases.

It is known to equip display cases and counters with tubular frame members which are formed or adapted to have sockets inserted therein at desired points for receiving small sign carrying poles. This invention is directed to a socket of this type which is provided with a slit to facilitate its insertion and retention in a tubular frame member and has a form of tapered bore for receiving and holding sign posts.

3,664,618
DUAL-PURPOSE BASE FOR USE AS A SIGN SUPPORT OR TO FORM A VEHICLE BARRICADE

Alfred H. Krueger, Palmyra, Wis., assignor to A. H. Krueger Inc., Milwaukee, Wis.

Filed June 19, 1970, Ser. No. 47,753
Int. Cl. G09f 17/00
U.S. Cl. 248—44 1 Claim

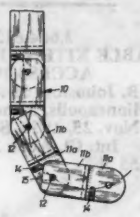


A frusto-conical precast concrete base member which is portable but of sufficient weight to form a semi-permanent installation is provided with a vertical bore in its top surface into which a staff or rod can be removably inserted to permit the use of the unit as a support for an indicator sign or flag in parking areas or the like, or permitting the mounting of an eye bolt therein and the fastening of chains or the like between a plurality of said base members to form a temporary or permanent vehicle barricade.

3,664,619
CHAIN FOR SUPPORTING ENERGY CONVEYING MEANS, AND CHAIN LINK THEREFOR

Klaus Heidrich, Siegen, Alfred Krewitt, Kreutzal, Kurt Loos, Dreis-Tiefenbach, and Fritz Pithan, Huttental-Weidenau, Germany, assignors to Kabelschlepp Gesellschaft mit beschrankter Haftung, Siegen, Germany

Filed June 24, 1970, Ser. No. 49,347
Claims priority, application Germany, June 26, 1969, P 19 32 428.8
Int. Cl. F16l 3/16; F16g 13/02
U.S. Cl. 248—51 18 Claims

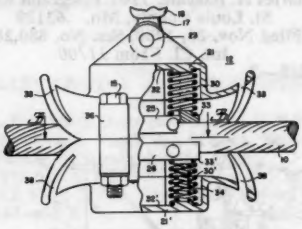


A chain for supporting energy conveying means, especially power lines and hoses, and a chain link therefor, according to which the chain links are of H-shape having two oppositely located laterally elastically yieldable arms interconnected by a transverse wall while two oppositely located arm sections of each link are provided with holes and the other two oppositely located arm sections of the same link are provided with studs having a diameter corresponding to a slide fit in said holes, the arrangement being such that the studs of one chain link pivotally engage the holes of the next following chain link.

3,664,620
VIBRATION DAMPENING CLAMP FOR ELECTRICAL TRANSMISSION AND DISTRIBUTION LINES

Lonnie J. Branum, 2412 W. Stella Lane, Phoenix, Ariz. 85015

Filed Feb. 16, 1971, Ser. No. 115,629
Int. Cl. H02g 7/00; F16l 3/00; F16g 11/06
U.S. Cl. 248—63 5 Claims



A clamp for electric power lines employing a pair of cooperating jaws having clamping shoes mounted therein for movement laterally of the conductor, each shoe being spring biased into engagement with the conductor for balanced dampening action.

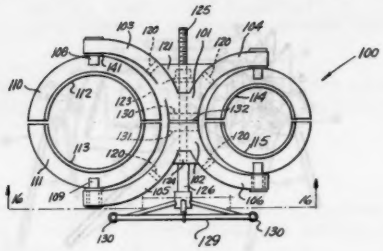
3,664,621
UNDERWATER PIPELINE-RISER CLAMPS FOR USE ON OIL AND GAS PIPELINES

Hilbert J. Savole, Jr., P.O. Box 98, Boutte, La. 70070

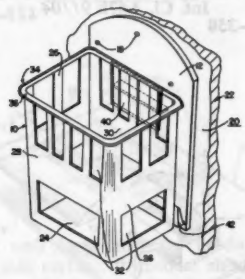
Filed Aug. 28, 1970, Ser. No. 67,864
Int. Cl. F16l 3/10
U.S. Cl. 248—74 R 7 Claims

The invention consists of double clamp assemblies which have segments pivoted relative to each other for attaching

gas and oil vertical pipelines to platforms located offshore. The clamps allow swiveling adjustment of a pipe relative to the leg member of a platform to which it is to be attached. The clamps may include screw-adjusted link means for regulating the relative orientation of the clamping segments.



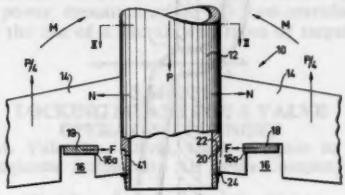
3,664,622
GARBAGE BAG RETENTION MEANS
Angelo L. Vaccaro, 218 St. Francis Blvd., Daly City, Calif. 94015
Filed July 8, 1970, Ser. No. 53,044
Int. Cl. B65b *67/12*
U.S. Cl. 248—95 **7 Claims**



Apparatus for supporting flexible garbage bags constructed of paper and the like in garbage receiving position which retains the bags to the inside of a kitchen cabinet door. A mounting plate is secured to the door and includes a pair of vertically spaced upper and lower members that define a storage space for folded bags and which demountably connect to the plate and the door inside a basket into which the open bag is placed.

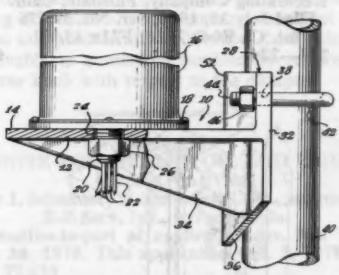
3,664,623
BASE STRUCTURE FOR FURNITURE
Sigvard Svenson, P.O. Box 127, 560 10 Skillingaryd, Sweden
Filed July 9, 1970, Ser. No. 53,401
Claims priority, application Sweden, July 18, 1969, 10,194/69
Int. Cl. F16m *11/20*
U.S. Cl. 248—188.7 **5 Claims**

There is provided a new type of supporting base structure to be used as, for example, a furniture pedestal or foot, the structure forming a completely "screw joint free" assembly comprising radial support members connected and held together at their inner ends by, first, a locking ring engaging in and received in recesses on the underneath of the members and, secondly, a hub member introduced through the center of the locking ring between the ends of the supporting members, engaging said ends,



the arrangement being such that when the hub member is placed under load, a strong assembly is formed wherein all members are rigidly interlocked by wedge action.

3,664,624
UNIVERSAL BRACKET FOR MOUNTING MERCURY BALLASTS
Ernest M. Freegard, Evanston, Ill., assignor to Advance Transformer Co., Chicago, Ill.
Filed Aug. 17, 1970, Ser. No. 64,470
Int. Cl. F16m *13/02*
U.S. Cl. 248—221 **4 Claims**

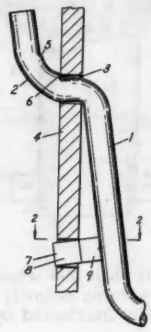


A bracket is provided which is a unitary casting having a shelf that acts as a floor with an opening upon which the end of the ballast rests in heat-sink relationship. The ballast nipple passes through the opening so that the connections to the ballast are made from below the shelf. At least two braces are provided extending from the bottom of the shelf to the back-plate. The back-plate is of V construction but having flats which are perforated substantially above the shelf so that the V may be secured to a pole by a suitable shackle or the flats may be engaged against a flat surface and secured by screws or bolts passing through the perforations.

3,664,625
PEGBOARD HOOK FOR ALTERNATE THICKNESS PEGBOARDS
John R. Price, Michigan City, Ind., assignor to Leigh Products, Inc., Coopersville, Mich.
Filed Aug. 14, 1970, Ser. No. 63,762
Int. Cl. A47f *5/00*
U.S. Cl. 248—223 **7 Claims**

A vertical wire has a rearwardly turned hook at its upper end to engage through holes in thick or thin apertured panels. A stepped stud is secured to the wire below the upper hook to project into a lower hole in the apertured panel. The rear end of the stud is sized to fit within

smaller holes in thin apertured panels, while the enlarged forward end is sized to fit into holes in thicker apertured panels. The stud is a flat block of generally



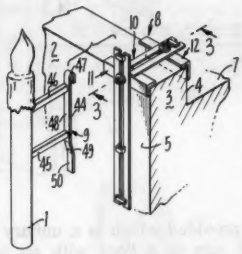
rectangular cross section with the corners of the sections fitting the two sizes of holes. As an alternate, a stepped rectangular stud is molded on a supporting ring, and the ring is slid into position along the wire of the hook.

3,664,626

BRACKET FOR MOUNTING DECORATIONS ON A BUILDING FRONT

Lee J. Sneller, Fresno, Calif., assignor to Valley Decorating Company, Pinedale, Calif.

Filed July 30, 1970, Ser. No. 59,576
Int. Cl. E04b 7/18; F21v 33/00
U.S. Cl. 248—224 **6 Claims**



A bracket assembly for attaching an ornament to a building roof line or marquee including: an adjustable support having one member which is adjustable horizontally to snugly fit over the top of the roof line or marquee and another member which extends along the front side of the roof line or marquee and is vertically adjustable; and an ornament holder which interlocks with said other member.

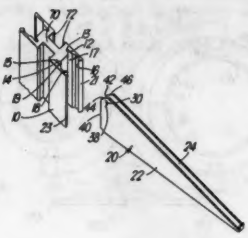
3,664,627

ADJUSTABLE SUPPORTS

Christopher Charles Sykes, London, and Charles Henry Pentland Denroche, Kingston-on-Thames, England, assignors to Nexus Limited, London, England

Filed Feb. 10, 1970, Ser. No. 10,193
Claims priority, application Great Britain, Feb. 21, 1969, 9,565/69
Int. Cl. A47g 29/02
U.S. Cl. 248—246 **14 Claims**

Shelving structure comprising uprights and brackets, each upright being a simple extrusion and having one or more forwardly opening grooves along its rear face, the upright being preferably U-sectioned to have a forwardly extending wall, out of which laterally projects a respective rearwardly facing abutment face; a bracket comprises one or two sidewalls out of which extends a respective projection. With the bracket tilted upwards, the projection can be hooked behind the abutment face; lowering of the



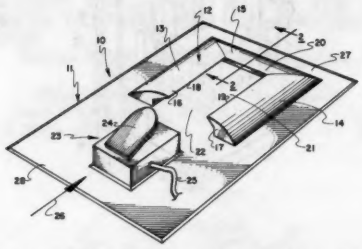
bracket then forces the end edge of the sidewall into the groove. The bracket can thereby be releasably and rigidly held at any point along the length of the upright without further fastening. The uprights can be composite free-standing and interconnectable.

3,664,628

FLOOR MAT FOR STABILIZING FOOT PEDAL BOX

Hartsel Ledahl Noble, 4400 Cathedral Oaks Road, Santa Barbara, Calif. 93110

Filed Feb. 13, 1969, Ser. No. 799,007
Int. Cl. A47b 91/04
U.S. Cl. 248—350 **1 Claim**



A floor mat incorporates a retention slot defined by a pair of parallel stop walls and a barrier wall that intersects the stop walls. The stop walls limit side movement tendencies of a foot pedal control box, such as that used to operate a sewing machine, while the barrier wall limits forward motion tendencies of the box so that the box can be accurately and stably held at a desired location.

3,664,629

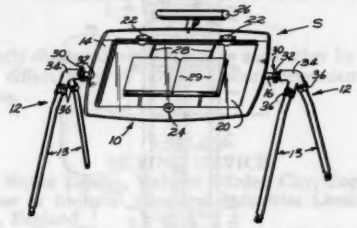
ADJUSTABLE STAND

Dwight L. Reed, 2951 Central, Riverside, Calif. 92506

Filed May 14, 1970, Ser. No. 37,199
Int. Cl. A47b 23/02
U.S. Cl. 248—445 **1 Claim**

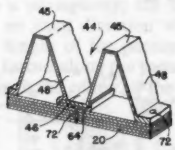
A book-holding stand having a shallow tray with a flat bottom against which an open book can be placed and held for reading purposes. The tray is fixedly secured to a tubular crosspiece which is supported between two pairs of spreading legs in such a way as to permit rotatable adjustment of the tray through 360 degrees around the axis of the crosspiece. Disposed within the tray are two

strips of exerciser cord, designed and positioned to hold the outstretched covers of a book flat against its bottom. Additionally, the tray has a stiff, transparent plastic cover fastened in place by means of spring cabinet hinges. The parts of the stand cooperate to hold an open book in reading position in the tray behind the plastic cover, and



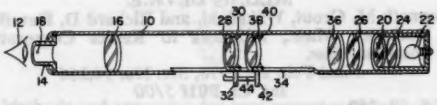
permit the cover to be opened as necessary for easy turning of the pages of the book. The tray can be turned to face any reader, even one lying on his back. The legs of the stand are bent, and can be swiveled and telescopically adjusted to vary the height and position of the book-holding tray.

3,664,630
CONCRETE WALL FORM LINER
James D. Maynen, Arlington Heights, and George F. Bowden, Northbrook, Ill., assignors to Symons Mfg. Company, Des Plaines, Ill.
Filed June 19, 1970, Ser. No. 47,771
Int. Cl. B28b *7/36*
U.S. Cl. 249—112 **2 Claims**



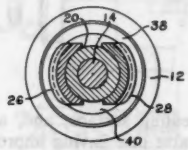
A concrete wall form liner for producing a ribbed concrete wall side surface, formed of sheet plastic material, having generally sinuous contour, and provided with complementary overlapping and interlocking end edge regions by means of which side-to-side continuity of adjacent liners may be attained. End-to-end continuity may be effected by the use of special filler blocks which align the sections longitudinally.

3,664,631
CYLINDRICAL LENS SYSTEMS FOR SIMULTANEOUS BIMERIDIONAL MEASUREMENT IN A LENS MEASURING INSTRUMENT
David Guyton, 460 Walnut St., Brookline, Mass. 02160
Filed Feb. 25, 1970, Ser. No. 14,051
Int. Cl. A61b *3/00, 3/02*
U.S. Cl. 351—27 **9 Claims**



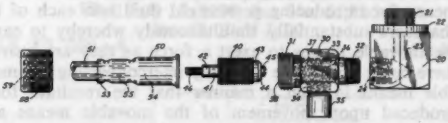
In a lens measuring instrument or optometer of the type employing a target, scale, and converging lens for measuring the power of a lens or the power error of an eye in two principal meridians, a pair of interposed cylindrical lens systems having orthogonal axes are disclosed for separating the target into two individually movable image segments. The lens systems are disposed such that one orthogonal target image segment may be moved through the plane of the other facilitating simultaneous power measurement of the two meridians and allowing the use of a plurality of types of targets.

3,664,632
LOCKING MEANS FOR A VALVE OPERATING PLUNGER
Harry M. Valentine, Elyria, Ohio, assignor to Bendix-Westinghouse Automotive Air Brake Company, Elyria, Ohio
Filed Dec. 10, 1970, Ser. No. 96,846
Int. Cl. F16k *35/00*
U.S. Cl. 251—101 **9 Claims**



In a valve device of the type having a reciprocable manually operable plunger and a knob carried thereby, the knob and plunger being movable downwardly within a casing a predetermined distance for operating a valve member together with a locking device cooperating with the casing for normally preventing movement of said plunger to said predetermined distance, the locking device being movable to a released position by relative movement of the knob with respect to the plunger.

3,664,633
REMOTE CONTROLLED OIL AND LIQUID DRAIN VALVE
Myer J. Schaffner, Westminster, Colo., assignor to E-Z Serv, Inc., Arvada, Colo.
Continuation-in-part of application Ser. No. 7,058, Jan. 30, 1970. This application Oct. 2, 1970, Ser. No. 77,623
Int. Cl. F16k *5/00, 31/64*
U.S. Cl. 251—294 **2 Claims**

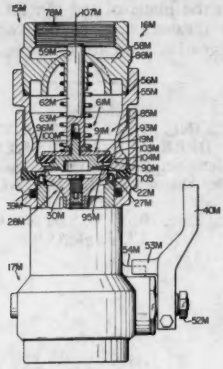


Oil is readily drained from an automotive vehicle engine crank case or oil pan by a remotely controlled especially adapted valve arranged to maintain closure tension on the valve in closed position.

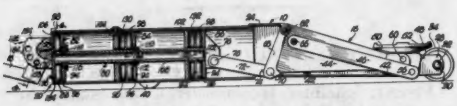
3,664,634
VALVE SEAL FOR COUPLING DEVICE
Robert W. Guertin, 9312 Neil Drive, Cincinnati, Ohio 45231, and Robert L. Murray, 331 6th Ave., Dayton, Ky. 01074
Continuation-in-part of application Ser. No. 538,411, Mar. 29, 1966. This application Sept. 19, 1968, Ser. No. 760,948
Int. Cl. F16l *37/28, 19/00*
U.S. Cl. 251—333 **4 Claims**

This disclosure relates to a normally closed valve for use in a fluid system which has a poppet means provided

with a sealing gasket and which has an offset annular sealing surface against which the gasket is urged to provide an improved seal which assures that fluid does not leak past such sealing surface; and, a coupling device utilizing such a valve and having improved sealing characteristics.



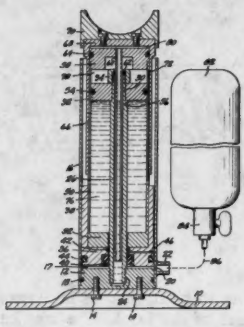
3,664,635
VEHICLE LIFT
Gary L. Kincaid, St. Joseph, Mo., assignor to Gray Manufacturing Company, Inc., St. Joseph, Mo.
Filed Mar. 23, 1970, Ser. No. 21,913
Int. Cl. B60p *1/48*
U.S. Cl. 254—8 B **4 Claims**



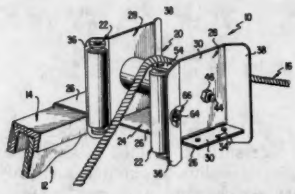
A low profile fluid operated lift for vehicles having a wheeled frame with a generally horizontally disposed cylinder carried thereby, the cylinder having a plurality of interconnected pressure chambers therein, there being movable means corresponding to each of the chambers, means for introducing pressurized fluid into each of the chambers substantially simultaneously whereby to cause the movable means to exert a force as they are moved, there being a shiftable assembly interconnecting the movable means in such a manner that the resultant force produced upon movement of the movable means and transmitted to the shiftable assembly is the sum of the forces produced by the individual movable means, the shiftable assembly being coupled with means for engaging and lifting a vehicle whereby such resultant force may be utilized to lift the vehicle. Safety retaining means are provided for holding the vehicle lift in a raised position regardless of the pressure of fluid in the chambers, said retaining means being mechanically disengageable to permit lowering of the lift.

3,664,636
FLUID PRESSURE VEHICLE JACK
John F. Sherrill, P.O. Box L, Plymouth, Ind. 46563
Filed Jan. 11, 1971, Ser. No. 105,458
Int. Cl. B66f *3/24*
U.S. Cl. 254—93 HP **8 Claims**

A fluid pressure vehicle jack comprising three telescoping cylinders and a piston fixed to one cylinder and located within a second cylinder. Said cylinders and piston are arranged to define four chambers. One of said chambers is connected to a supply of gas under pressure. Two other chambers contain liquid and are arranged to communicate and to permit expansion of one thereof while the other contracts. The fourth chamber is vented to atmosphere. Supply of gas under pressure causes simultaneous extension of each of the cylinders.



3,664,637
TROTLINE GUIDE
Emilio A. Troiano, 718 Sherbrook Drive, Silver Spring, Md. 20904
Filed Sept. 1, 1970, Ser. No. 68,717
Int. Cl. B66d *1/36*
U.S. Cl. 254—190 R **7 Claims**



A guide to be mounted on a boat to pick up and guide a trotline to a convenient point on the boat to facilitate the removal of the catch from the trotline. The guide utilizes a horizontal roller and a pair of vertical rollers to maintain the trotline in position in the guide once the line is picked up and placed therein. In addition to preventing the loss of the trotline from the guide, the three rollers permit the boat to smoothly traverse the length of the trotline without causing a loss of the catch due to snagging or other discontinuity as the line passes through the guide.

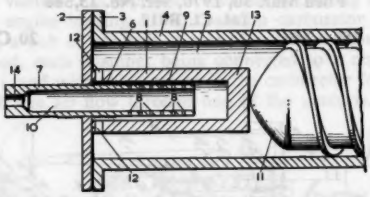
3,664,638
MIXING DEVICE
Kenneth M. Grout, Wakefield, and Richard D. Devellian, Rockport, Mass., assignors to Kenics Corporation, Danvers, Mass.
Filed Feb. 24, 1970, Ser. No. 14,266
Int. Cl. B01f *5/00*
U.S. Cl. 259—4 **3 Claims**

A device for thoroughly mixing components of a fluidic material flowing through a conduit which contains a plurality of curved sheet-like elements extending longitudinally through the conduit in which consecutive elements are

curved in opposite directions and the adjacent edges of consecutive elements are spaced from each other by a distance dependent on the Reynolds number of the fluid and

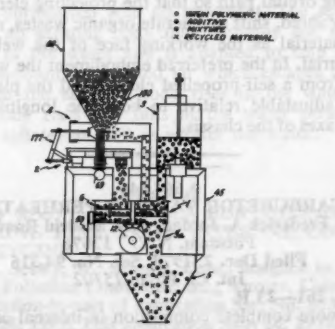
angularly displaced with respect to each other by an angle which differs from 90° by an amount dependent on said distance.

3,664,639
MIXING DEVICE
David Robin Lander, Welwyn Garden City, England, assignor to Imperial Chemical Industries Limited, London, England
Filed May 14, 1970, Ser. No. 37,187
Claims priority, application Great Britain, May 21, 1969, 25,863/69
Int. Cl. B01f *15/02*
U.S. Cl. 259—4 **11 Claims**



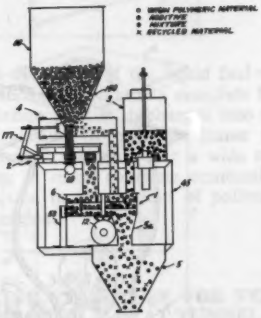
A mixing device consisting of a sleeve and a hollow core which define a passageway; the sleeve and the core being movable in an axial direction with respect to each other to alter the length of the passageway; the material to be mixed being forced along the passageway under pressure and then through the centre of the core.

3,664,640
METHOD AND APPARATUS FOR MIXING PARTICULATE SOLIDS
Joseph C. Morin, Northville, Mich., assignor to Application Engineering Corp., Elk Grove, Ill.
Filed July 17, 1970, Ser. No. 55,753
Int. Cl. B01f *7/20*
U.S. Cl. 259—8 **15 Claims**



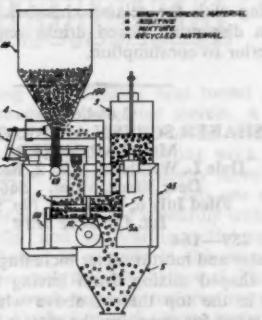
Methods and apparatus for continuous, multi-stage mixing of at least two particulate solids. The materials to be mixed are introduced into an annular horizontal mixing zone and advanced therealong as a tumbling leading mass with a portion of the outer end of the mass derived continuously as a residual stream trailing along the outer periphery of the zone while a second, larger portion of the leading mass is diverted inwardly as a trailing mass along the inner periphery of the zone, the trailing mass being diverted in a tumbling mode so that a part thereof is combined with the trailing residual stream. The invention is especially useful for mixing particulate polymeric material with an addtive such as a dry colorant.

3,664,641
MIXING APPARATUS
Joseph C. Morin, Northville, Mich., assignor to Application Engineering Corp., Elk Grove, Ill.
Filed July 17, 1970, Ser. No. 55,875
Int. Cl. B01f *7/20*
U.S. Cl. 259—8 **7 Claims**



Apparatus for combining a first particulate material, such as a particulate mixture of polymeric material and a colorant, with a predetermined proportion of a second particulate material, such as reground and recycled polymeric material, characterized by employing two feeding devices for the respective particulate materials, with one feeding device operating to feed a fixed quantity in response to each occurrence of a predetermined feed operation of the other feeding device.

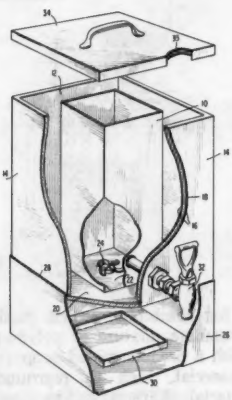
3,664,642
MIXING APPARATUS
Joseph C. Morin, Northville, Mich., assignor to Application Engineering Corp., Elk Grove, Ill.
Filed July 17, 1970, Ser. No. 55,926
Int. Cl. B01f *7/20*
U.S. Cl. 259—8 **8 Claims**



In a multi-stage mixing apparatus, typically for mixing particulate polymeric materials with colorants, characterized by a mixing unit having a housing which can be

moved between an operative position and a laterally displaced position, the interior of the housing being divided into a plurality of mixing zones by a series of pans nested in the housing, each pan being equipped with a mixing and advancing rotor, and the rotors and pans being easily removed, for cleaning, and replaced when the housing is in its laterally displaced position. The pans are identical and the rotors are identical, and special provision is made to allow the pans and rotors be replaced without requiring special skill and attention on the part of the operator.

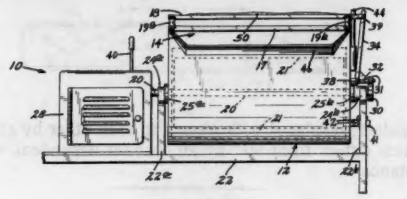
3,664,643
BEVERAGE MIXER AND DISPENSER
Angelo L. La Neve, West Paterson, N.J., assignor to ALN Enterprises
Filed May 11, 1970, Ser. No. 36,268
Int. Cl. B01f *7/16*; B67d *1/00*
U.S. Cl. 259—44 **12 Claims**



An improved beverage dispenser comprising a non-circularly cross-sectioned, upright mixing chamber having a closed bottom and an open top; an agitating means within said mixing chamber adapted to be actuated through the mixing chamber bottom by a rotatable shaft; an insulated cooling chamber surrounding the mixing chamber in at least its vertical extension; a base beneath and upon which the mixing and cooling chamber rests and adapted to support an electric motor with a rotatable shaft whereby the agitating means in said mixing chamber is actuated; a removable, leakproof top covering the open top of the mixing chamber; and a beverage withdrawal spigot communciating with the mixing chamber. The dispenser is useful in dispensing mixed drinks requiring substantial mixing prior to consumption.

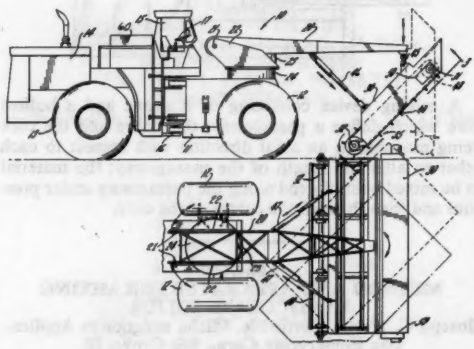
3,664,644
SHAKER SCREEN APPARATUS FOR MORTAR MIXERS
Dale L. Wicklund, R.R. 2, Box 157A, Deer River, Minn. 56636
Filed July 6, 1970, Ser. No. 52,545
Int. Cl. B28c *5/14*
U.S. Cl. 259—164 **7 Claims**

A plaster and mortar mixer including a generally cylindrically shaped mixing drum having a horizontal inlet opening in the top thereof above which is mounted a shaker screen for screening the plaster or mortar prior to mixing. The screen is mounted on rubber supports carried by the mixing drum and is moved in a reciprocal manner above the inlet opening. The reciprocal motion is provided by first and second arms which are normally joined and pivotally mounted to the mixing drum; the first arm having motion imparted thereto by a cam coaxially mounted



on the mixing shaft and the second arm being connected to the shaker screen.

3,664,645
COMPOST AND REFUSE SHREDDING AND SHIFTING APPARATUS
Herbert T. Cobey, P.O. Box 313, Crestline, Ohio 44827
Filed Mar. 30, 1970, Ser. No. 23,566
Int. Cl. B01f
U.S. Cl. 259—183 **20 Claims**

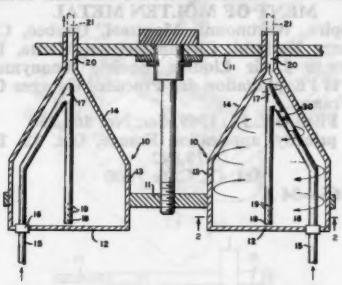


An endless web carrying a plurality of outwardly projecting elements is moved in an upwardly and forwardly extending orbital path so that the projecting elements successively shred, shift and aerate organic wastes, refuse and other material as the working face of the web engages the material. In the preferred embodiment the web is supported from a self-propelled chassis and the plane of the web is adjustable relative to both the longitudinal and vertical axes of the chassis.

3,664,646
CARBURETOR VAPOR SUPERHEATER
Frederick A. Jordan, R.D. Madrid Road, Potsdam, N.Y. 13676
Filed Dec. 2, 1970, Ser. No. 94,316
Int. Cl. F02m *15/02*
U.S. Cl. 261—23 R **3 Claims**

For more complete combustion in internal combustion engines, a swirl chamber is supplied in the fuel line between the fuel supply vessel and the carburetor venturi. The chamber is circular at the bottom and has an inverted funnel-shaped top, the top having a conduit line leading to the venturi. A fuel pipe leading from the supply vessel extends through the floor of the chamber, sealed

thereto, to the top of the chamber where it is bent sharply downward to extend axially to a closed end at the chamber floor. The closed end has a plurality of openings therearound through the pipe wall, each opening being inclined from radially toward tangentially in the same sense from the radial for imparting a circularly swirling motion to the emitted gas which is drawn upward by suction at the venturi increasing in velocity as it nears the



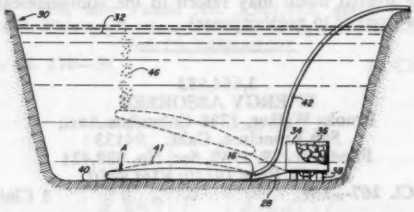
chamber top. The helically swirling gas at the top heats the top of the fuel pipe and superheats the vapor drawn to the venturi. For increased vacuum at starting and for heavy engine loading a high vacuum carburetor is used having a pair of venturis, a pair of swirl chambers being provided, each chamber being connected to a respective venturi, and with valve means in the carburetor for shutting off the air flow through one of the venturis.

3,664,647

AERATING SYSTEM

John F. Snow and Roy L. Clough, Jr., Bristol, N.H., assignors to Xodar Corporation, Warwick, R.I.

Filed July 22, 1970, Ser. No. 57,171
Int. Cl. B01f *3/04*
U.S. Cl. 261—30 **24 Claims**



Apparatus for introducing fine air bubbles into sewage and waste water of a sewage treatment plant to effect biological purification with air treatment. The apparatus comprises an aerating body that normally has negative buoyancy in the water and is adapted to trap and be rendered buoyant by injected air which escapes into the water when the aerating body rises in the water. The aerating body rises and falls in the water periodically so that it agitates as well as aerates the water.

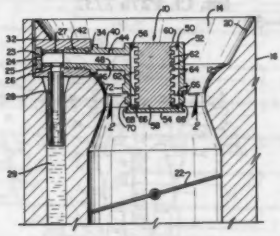
3,664,648

METHOD AND APPARATUS FOR MIXING AND METERING FUEL IN AN INTERNAL COMBUSTION ENGINE

Harvey E. Seeley, Jr., Aurora, Colo., assignor to American Pollution Controlled, Inc., Aurora, Colo.

Continuation-in-part of application Ser. No. 803,168, Feb. 28, 1969. This application Apr. 20, 1970, Ser. No. 29,874
Int. Cl. F02m *7/02*
U.S. Cl. 261—41 R **24 Claims**

An improved method and means are disclosed for mixing liquid fuel with air for discharge in metered quantities into the airstream of a carburetor or other air induction passage of an internal combustion engine. The liquid fuel is induced to flow through a delivery tube for mixture with air by the negative pressure differential developed across a series of small discharge orifices which are so spaced and arranged in the airstream as to disperse metered quantities of the fuel/air mixture into the airstream with a high degree of lateral penetration. The forms of devices disclosed achieve extremely fine atomi-



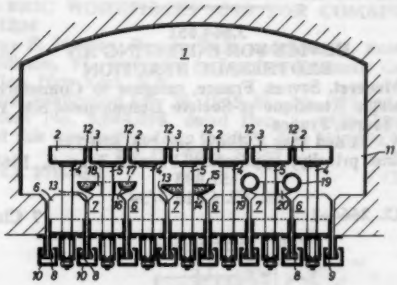
zation, mixing and dispersion of the liquid fuel with air to the extent of effecting substantially complete foaming of the fuel/air mixture as it is discharged into the airstream, making it possible to schedule leaner fuel/air ratios which will remain constant over a wide range of speed and resulting in more complete combustion and a substantial reduction in the amount of pollutants exhausted from the engine.

3,664,649

FURNACE HAVING STRUCTURE FOR FEEDING WORK THROUGH A HEAT TUNNEL

Heinz Brockmann, Dusseldorf-Gallberg, Germany, assignor to Brockmann & Bundt Industrie-Ofenbau, Dusseldorf, Germany

Filed Jan. 26, 1970, Ser. No. 5,742
Claims priority, application Germany, Apr. 16, 1969, P 19 19 156.1
Int. Cl. F27b *9/14*
U.S. Cl. 263—6 A **10 Claims**



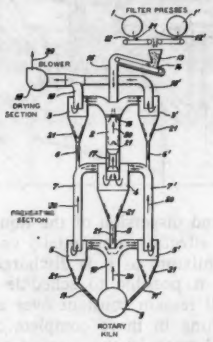
A furnace having an elongated heat tunnel through which the work passes to be heated therein. A pair of sets of beams extend longitudinally of the heat tunnel and form a floor thereof for supporting work, and at least one of the sets of beams is cyclically movable with respect to the other in such way that this one movable set of beams moves upwardly and forwardly with respect to and downwardly and rearwardly with respect to the other set of beams to provide in this way a stepwise advance of the work through the tunnel. The beams have laterally offset work-engaging surfaces to provide a more uniform heat distribution at the lower surface of the work. Also, the structure which controls the movement of the beams provides for the latter a smooth, gradual movement when the work is raised up from and again set down on the upper surfaces of the beams.

3,664,650

APPARATUS FOR HEAT TREATMENT OF MATERIAL FROM WHICH WATER HAS BEEN MECHANICALLY EXTRACTED

Paul Weber, Oelde, Horst Ritzmann, Neubeckum, and Gerhard Butschko, Ennigerloh, Germany, assignors to Polysius AG, Neubeckum, Germany

Filed Mar. 30, 1970, Ser. No. 23,859
Claims priority, application Germany, May 23, 1969, P 19 26 485.8
Int. Cl. F27b 7/32
U.S. Cl. 263—32 1 Claim



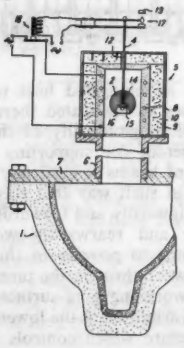
An apparatus for heat treatment of non-tacky material which has been prepared by a wet process comprises apparatus for drying the material from which water has been mechanically extracted, including a drying stack adapted to be charged centrally from above with such material and two cyclone separators connected symmetrically to the upper end of the stack, for contacting the material with hot gas. The stack is narrowed in cross section in its lower portion and has a deflector in its upper portion arranged in the path of the falling material. An apparatus for preheating the dried material includes two lower cyclone separators connected in parallel and a central cyclone separator arranged above them whose dip pipe is the lower end of the drying stack.

3,664,651

DEVICE FOR INITIATING AN EXOTHERMIC REACTION

Jean Meneret, Sevres, France, assignor to Comissariat a l'Energie Atomique et Societe Desmarquest SA, Paris and Sevres, France

Filed May 1, 1969, Ser. No. 820,734
Claims priority, application France, May 9, 1968, 151,093
Int. Cl. C21d 1/34
U.S. Cl. 266—1 7 Claims



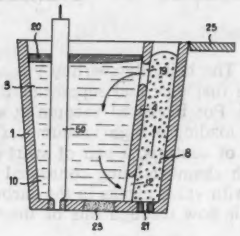
An exothermic reaction in a reactional mass is initiated by dropping under the action of gravity a block of refractory material which has previously been suspended above the reactional mass and heated to a predetermined temperature which is sufficient to start the reaction as the refractory block comes into contact with the reactional mass.

3,664,652

METHOD AND APPARATUS FOR THE TREATMENT OF MOLTEN METAL

Etienne Spire, Westmount, Montreal, Quebec, Canada, and Pierre Karinthi, Champaigny-sur-Marne, France, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Filed Oct. 14, 1969, Ser. No. 866,250
Claims priority, application France, Oct. 22, 1968, 170,842
Int. Cl. C21c 7/00
U.S. Cl. 266—34 A 11 Claims



The molten metal to be treated is made to ascend from a compartment in a first vertical conduit by an injection of gas. From the first conduit, the metal flows through a substantially horizontal conduit where farther gas may be injected.

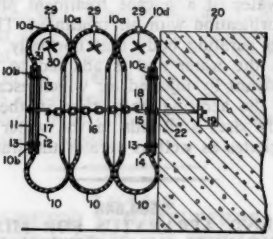
The treated metal may return to the compartment it comes from or to another vessel.

3,664,653

ENERGY ABSORBER

Brooks Walker, 1280 Columbus Ave., San Francisco, Calif. 94133

Filed Dec. 29, 1969, Ser. No. 888,421
Int. Cl. B60r 19/10; F16f 9/10
U.S. Cl. 267—139 3 Claims



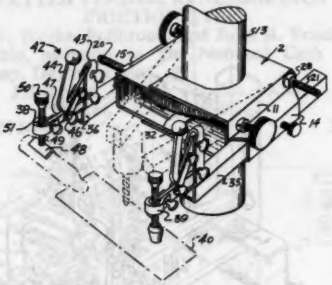
This invention pertains to an energy absorber for use on abutments or the front of vehicles to absorb energy when the vehicle abuts against another vehicle or a vehicle abuts against an abutment; the absorber to be joined by one or more tires, filled with a liquid such as water and with one or more blow out plugs to allow the liquid to escape when impacted, the ends or rim sides of the tires to be closed and connected by flexible or collapsible means.

3,664,654

DUAL ARM ATTACHMENT FOR DRILL PRESS

George D. Manville, 35520 Oak Glen Road, Yucaipa, Calif. 92399

Filed Mar. 30, 1970, Ser. No. 23,759
Int. Cl. B23q 3/04, 3/10; B25b 5/14
U.S. Cl. 269—9 3 Claims



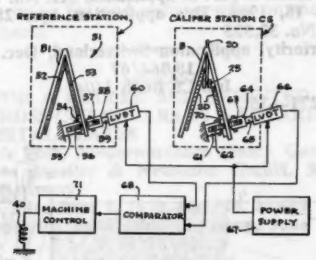
A universal attachment mountable on the column of a drill press, or the like, in which a pair of angularly, linearly adjustable arms extend from opposite sides of the support above the drill press work table to position and clamp elongated work pieces of any cross-sectional shape during drilling operations thereon.

3,664,655

CALIPER SYSTEM FOR SIGNATURE MACHINES

William B. McCain, Hinsdale, and James F. Cosgrove, Western Springs, Ill., assignors to McCain Manufacturing Corp., Chicago, Ill.

Continuation-in-part of application Ser. No. 748,380, July 29, 1968, now Patent No. 3,561,752, dated Feb. 9, 1971. This application Sept. 25, 1970, Ser. No. 75,550
Int. Cl. B65h 43/02
U.S. Cl. 270—56 13 Claims



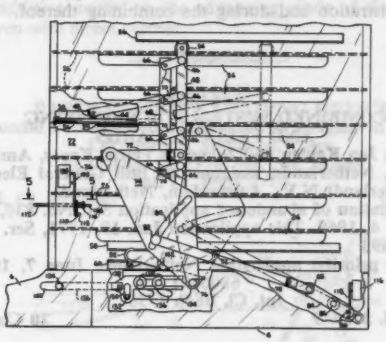
A caliper system for a cyclically operable signature gathering machine in which each unbound book of signatures moving toward a binding station passes between a fixed support and a movable roller probe that is biased toward the support so that the probe position is a function of book thickness. The probe is connected to the movable element of a linear voltage differential transformer or other electrical transducer, developing a book thickness signal of given frequency and amplitude. The book thickness signal is compared with a reference signal of corresponding frequency having an amplitude representative of a correct book thickness to control machine operation and prevent binding of incorrectly assembled books.

3,664,656

COLLATOR HAVING GATHER ACTUATED CONTROL

Peter M. Ryland, Ridgefield, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Filed Oct. 15, 1970, Ser. No. 80,904
Int. Cl. B65h 39/02
U.S. Cl. 270—58 5 Claims



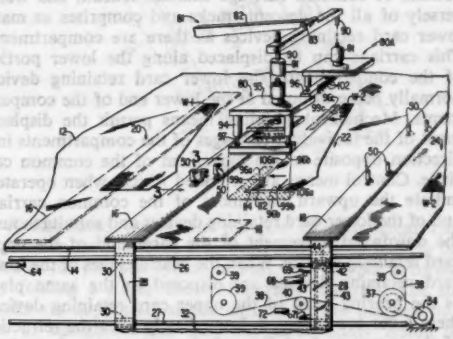
A collator having trays spaced one above the other in a frame, pusher means associated with each station on the trays and having a common drive means for cyclically pushing a sheet from each stack of sheets at each station to a position where a user can gather the sheets with a continuous hand movement, and actuating means responsive to the movement of the sheets as they are gathered, which actuating means initiates the drive means to repeat the feed cycle so that when the user has finished gathering and stacking the sheets from the collator a next set of sheets are waiting to be gathered.

3,664,657

METHODS AND APPARATUS FOR AUTOMATICALLY TRANSFERRING AND REGISTERING FABRIC WORKPIECES AND FOR COMBINING THEM

George F. Hawley, Bogota, N.J., and John H. Buettner, Williston, Vt., assignors to Ivanhoe Research Corporation, New York, N.Y.

Original application July 30, 1965, Ser. No. 475,986, now Patent No. 3,544,098, dated Dec. 1, 1970. Divided and this application Dec. 9, 1969, Ser. No. 879,975
Int. Cl. B65h 39/02
U.S. Cl. 270—58 5 Claims



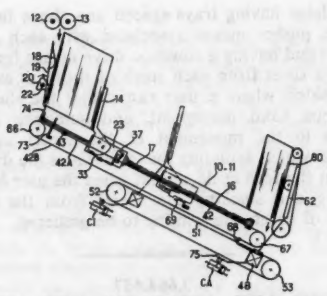
Methods and apparatus for automatically transferring, registering and combining fabric workpieces, including

means for moving the fabric workpieces over a supporting surface upon which they can be slid, means for impelling one or more of their edges outwardly against one or more stop surfaces in known positions to register the workpieces with respect to the positions of the stop surfaces, and means for maintaining the known orientation and relationship relative to the other workpieces during the subsequent transfer of the workpieces following registration and during the combining thereof.

3,664,658
COMBINED SYSTEM FOR RECEIVING AND FEEDING CARDS

Gerben Jan Keulen and Johannes Petrus Kroes, Amsterdam, Netherlands, assignors to Bull General Electric (Nederland) N.V., Amsterdam, Netherlands

Continuation of abandoned application Ser. No. 830,301, June 4, 1969. This application Jan. 19, 1971, Ser. No. 107,693
Claims priority, application Netherlands, June 7, 1968, 6808091
Int. Cl. B65h *1/30*
U.S. Cl. 271—9 **20 Claims**

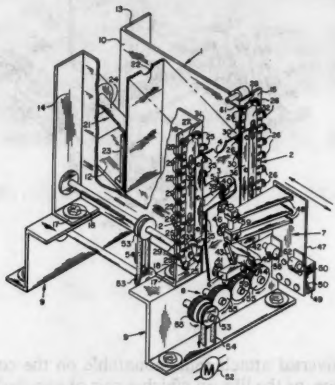


Sorting machine for record cards, comprising a plurality of receiving compartments disposed parallel alongside one another. Each compartment comprises an inclined bottom forming a descent track for the cards, a carriage arranged so that it can slide parallel to the said bottom and an upper card retaining device pivoted on this carriage and normally occupying a holding position for retaining collected cards in the upper portion of the compartment, these cards resting on edge on the inclined bottom. A common carriage extends beneath and transversely of all the descent tracks and comprises as many lower card retaining devices as there are compartments. This carriage can be displaced along the lower portion of the compartments, the lower card retaining devices normally being disposed at the lower end of the compartments. Mechanical coupling means permit the displacement of the individual carriages of the compartments in a direction opposite to the movement of the common carriage. Control means are provided which, when operated, initiate the upward movement of the common carriage and of the lower card retaining devices and simultaneously the downward movement of the cards and of the upper card retaining devices. When the bearing faces of the lower card retaining devices are disposed in the same plane as the bearing faces of the upper card retaining devices, these latter are retracted. Immediately after the retraction of the upper card retaining devices, the movement of the common carriage is reversed so as to permit the descent of the cards and of the lower card retaining devices to the bottom end of the compartments.

3,664,659
BAG STACK HOLDING AND SEPARATING DEVICE

Doyle R. Hudson, West Monroe, La., assignor to Olinkraft, Inc.

Filed Nov. 9, 1970, Ser. No. 87,764
Int. Cl. B65h *3/32*
U.S. Cl. 271—18 **5 Claims**

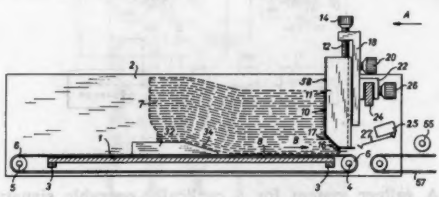


An apparatus for removing flat, flexible articles from a supply of such articles. The apparatus comprises: means for holding the foremost article in place; means for rotating an edge of said article outwardly from the supply; means for effecting a positive separation between the foremost and next successive article and means for holding the next successive article in place as the foremost article is removed. In a preferred embodiment the means for holding the bags in place comprise a circular outer periphery and will be rotatably mounted.

3,664,660
DEVICE FOR FEEDING FLAT OBJECTS TO A PROCESSING MACHINE

Kurt Runzi, Kusnachterstrasse 59, Zumikon, Switzerland

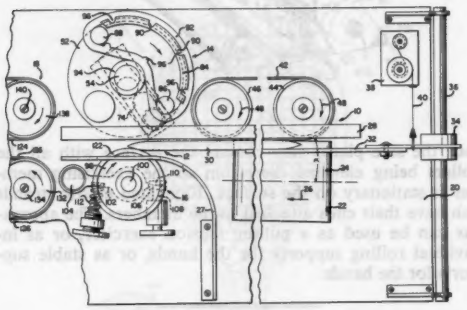
Continuation-in-part of application Ser. No. 784,594, Dec. 18, 1968. This application Apr. 28, 1970, Ser. No. 32,525
Claims priority, application Switzerland, Dec. 20, 1967, 18,064/67
Int. Cl. B65h *3/04*
U.S. Cl. 271—35 **6 Claims**



To feed stacked flat objects of varying size and/or thickness such as paper or carton sheets, newspapers, periodicals, printed matter envolopes or the like which are to be addressed in an addressing machine or otherwise processed, conveyor belts are located in frictional contact with the lowermost object of the stack. Two or more stop members, displaceable in lateral direction form, with the belt, a feed gap. The lower part of the abutment surfaces of the stop members are inclined relative to the vertical in transport direction. A vertically adjustable feed gap member having a curved gate surface, and a driven separator roller therebelow form, at

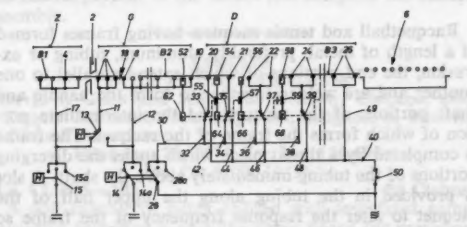
the lowest point of the gate member, a feed passage. They are located laterally offset with respect to the stop members. Switch means are located beyond the gate to interrupt movement of the belts after an object has passed the gap.

3,664,661
LETTER FEEDER, SYNCHRONOUS FRICTION TYPE
Horace W. Weeks, Bellbrook, and John R. Frazier, Dayton, Ohio, assignors to The National Cash Register Company, Dayton, Ohio
Filed Sept. 4, 1970, Ser. No. 69,560
Int. Cl. B65h *3/06*
U.S. Cl. 271—36 **3 Claims**



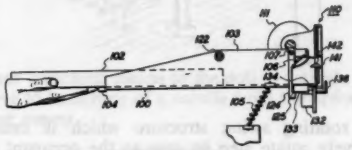
A synchronous-type apparatus for feeding letter mail of various sizes and thicknesses. A feed wheel and a stripper wheel are positioned in opposed relation at a feed area in the apparatus to receive therebetween letters which are to be singulated and fed to a processing unit. An elastomeric member is wrapped around a sector of the feed wheel to engage the letters along a line parallel to the long dimension of the letters. The feed wheel is rotated at varying angular velocities, so that the leading portion of the elastomeric member engages a letter to be fed at a low velocity, and the trailing portion of the elastomeric member discharges the letter at a higher velocity. The low velocity at engagement reduces the "scrubbing" action on the letters being fed and reduces wear on the feed and stripper wheels.

3,664,662
DRIVE FOR A ROLLER BED MOUNTED BEHIND THE CROSS-CUT SHEARS IN A SHEARING LINE FOR METAL PLATES
Peter Alois Linz, Niederwurzbach (Saar), Germany, assignor to Moeller & Neumann GmbH, St. Ingbert (Saar), Germany
Filed June 2, 1970, Ser. No. 42,689
Claims priority, application Germany, June 2, 1969, P 19 28 019.4
Int. Cl. B65h *5/06*
U.S. Cl. 271—51 **8 Claims**



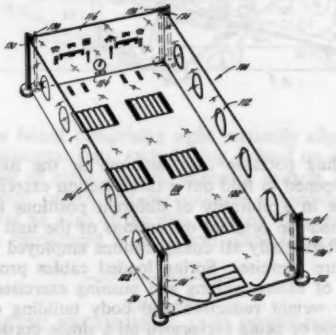
In the electrical drive for the rollers of a roller bed mounted behind the cross-cut shears of a shearing line for metal plates a first group of rollers in a roller bed are driven with direct current, a second group is driven with three-phase current. For positioning the plates which are advanced by the shears the rollers of the roller bed in the first group may be connected or driven in common while upon the crossing of plates over the joint between the two roller groups either individually and/or in groups the rollers of the second group driven with three-phase current are switched over by light barriers or the like in an additive matter on the advancing mode of the rollers driven with direct current.

3,664,663
PAPER CASSETTE LOADING DEVICE
Donald F. McPherson, Hilton, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed May 18, 1970, Ser. No. 38,466
Int. Cl. B65h *1/04*
U.S. Cl. 271—61 **3 Claims**



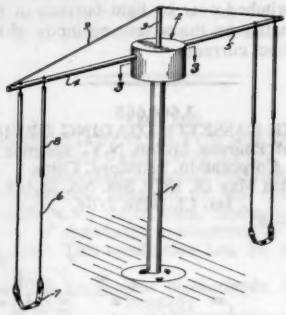
Apparatus for locating the feed rollers and paper snubbers of a sheet feeding mechanism in an inoperative position remote from the leading edge of sheets in a cassette while the cassette is being loaded into a copier so that the sheets in the cassette are not bent, ripped or otherwise deformed during loading, and then locating the feed rollers and paper snubbers in an operative position on the top sheet in the cassette in preparation for feeding the sheets from the cassette to the copier.

3,664,664
CHILD'S VEHICLE-SIMULATING COLLAPSIBLE PLAYPEN
Jeff W. Napier, 19 Glen Hill Court, Glendale Heights, Ill. 60137
Filed Apr. 3, 1970, Ser. No. 25,448
Int. Cl. A63g *31/00*
U.S. Cl. 272—1 C **2 Claims**



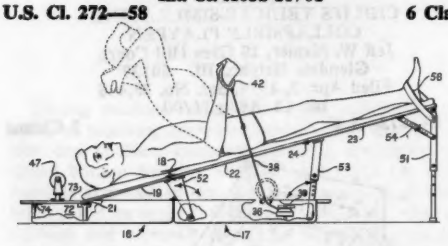
A simulated collapsible playpen of rectangular configuration having three side walls and a floor leaving one side of the playpen without a wall. The playpen is formed by folding a single sheet of flexible material. The side walls are supported at the corners of the playpen by a set of uprights which may be placed either inside the playpen on base supports or adjacent its outer periphery pushed into the ground. The interior of the playpen is embossed with features which are identified with the inside of a vehicle or building structure.

3,664,665
OCCUPANT PROPELLED ROTATING SWING
Walter L. Scott, 3101 E. 2nd St.,
Long Beach, Calif. 90803
Filed Apr. 2, 1970, Ser. No. 25,171
Int. Cl. A63g *1/20*
U.S. Cl. 272—33 R 1 Claim



In a rotating swing structure which is caused to progressively rotate step by step as the occupant swings back and forth in the swinging unit of the device. The swing will rotate by small increments as long as the swinging unit reciprocates. The rotating movement will continue only in one direction, and is prevented from regressing by a member which grips a stationary ring.

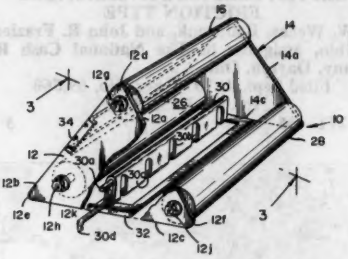
3,664,666
PORTABLE GYMNASIUM
William R. Lloyd, 3386 Sutton Loop,
Fremont, Calif. 94536
Filed Nov. 5, 1970, Ser. No. 87,249
Int. Cl. A63b *21/02*
U.S. Cl. 272—58 6 Claims



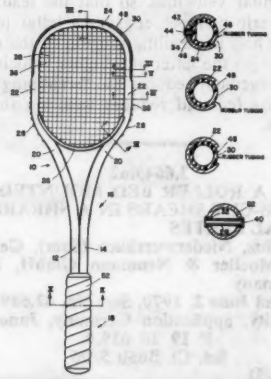
A folding portable case, suitcase or the like which may be opened to fold out a three-section exercise board disposable in a plurality of different positions in extension beyond the original dimensions of the unit for providing substantially all configurations employed in physical culture exercises. Spring loaded cables provide for all types of lifting, pulling and pushing exercises so that complete weight reduction and body building exercises are capable of being performed on a single portable unit.

3,664,667
PUSH-PULL ROLLER OR STATIONARY TYPE EXERCISING APPARATUS
Edward J. McCarthy, 31—41 85th St.,
Jackson Heights, N.Y. 11370
Filed May 18, 1970, Ser. No. 37,957
Int. Cl. A63b *21/00*
U.S. Cl. 272—83 R 10 Claims

An exercising apparatus constituting two exercising members, each including three rollers freely rotatable and supported by two parallel side plates. The rollers are arranged with respect to the side plates so that in one orientation of the side plates relative to a flat surface two of the rollers may be placed in contact with the surface with the side plates elevated therefrom to enable the exercising member to be rolled along the surface. In a second orientation of the exercising member relative to the surface the side plates may contact the surface with all the rollers being elevated therefrom so the exercising member is stationary on the surface. Elongated elastic strands can have their ends attached to the members. The apparatus can be used as a pulling tension exerciser, or as individual rolling supports for the hands, or as stable supports for the hands.



3,664,668
RACKETBALL OR TENNIS RACKET HAVING A TUBULAR METAL FRAME
Franklin W. Held, 7079–E Mission Gorge Road,
San Diego, Calif. 92120
Filed Apr. 3, 1970, Ser. No. 25,528
Int. Cl. A63b *49/06, 49/12, 49/14*
U.S. Cl. 273—73 C 11 Claims



Racquetball and tennis racquets having frames formed of a length of metal, preferably aluminum, tubing or extrusion, the end portions of which extend parallel to one another and are welded together to form the handle and shaft portions of the racquet and the intermediate portion of which forms the frame of the racquet. The frame is completed by a throat piece which spans the diverging portions of the tubing immediately above the shaft. A slot is provided in the tubing along the upper half of the racquet to alter the response frequency of the frame so that it coincides with that of the ball. Holes are provided in the tubing of the racquet and in the throat piece to receive the racquet strings. Hollow rivets or bushings may be provided in these holes to prevent cutting of the strings

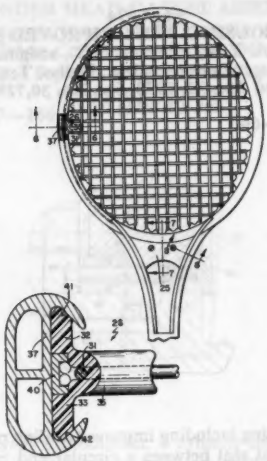
by the edges of the holes. A length of rubber or plastic may be positioned in the slot of the frame to add weight to the racquet and for protective purposes.

3,664,669

GAME RACKET WITH STRING SUPPORT INSERT MEANS

Peter A. Latham, Newburyport, and Paul E. Brefka, Southboro, Mass. (both % LBA, Inc., 39 Commercial Wharf, Boston, Mass. 02110)

Filed Sept. 29, 1969, Ser. No. 861,701
Int. Cl. A63b *49/12, 51/00*
U.S. Cl. 273—73 D 12 Claims



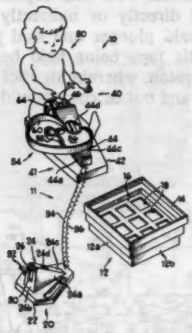
A game racket comprises an aluminum extrusion that includes a central wall separating the hollow outside portion from a pair of flanges pointed toward each other to define an inside that receives a series of plastic string supporting elements in the head portion of the frame. The string support elements are formed with upwardly and downwardly extending base portions seated in the upper and lower grooves, respectively, of the inside channel in the extrusion. A hollow string support portion extends transversely from the base portions and has an inward edge of generally C-shape through which a string may be looped. Keeping the base portions urged apart seats the string support in the inside channel. A cross piece at the lower end of the head portion of the racket carries additional string support elements and fastens together opposed portions of the aluminum extrusion to form the head portion of the racket. A handle member secures the lower portions of the extrusion together to define the handle portion of the racket and complete the racket assembly.

3,664,670

DOLL LAUNCHER GAME

Marvin I. Glass and Jeffrey D. Breslow, Chicago, and Eugene Jaworski, Park Ridge, Ill., assignors to Marvin Glass & Associates

Filed Jan. 28, 1971, Ser. No. 110,699
Int. Cl. A63h *33/26*
U.S. Cl. 273—101 18 Claims



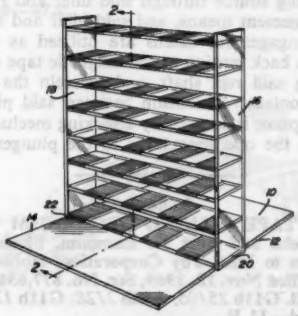
A doll capable of being utilized with associated game apparatus including a grid-like game board for receiving ball-like missiles. An active player launching means is provided together with a launching means for the doll. Motor means in the doll is associated with linkage for driving an arm of the doll through a path of travel to launch a missile towards the game board. Circuitry connects the active player launching means to the doll to activate the doll responsive to launching of a missile from the active player launching means.

3,664,671

THREE-DIMENSIONAL GAME BOARD

Joseph W. Davis III, 651 Elm St., Buffalo, N.Y. 14203

Filed Mar. 25, 1970, Ser. No. 22,448
Int. Cl. A63f *3/02*
U.S. Cl. 273—131 AC 6 Claims



A game board comprising eight vertically aligned and spaced horizontal slats, each having defined on its upper face a row of eight squares, alternate squares being of two different colors and the coloring extending downwardly over an edge of the slat, whereby the game board pattern is reproduced in a vertical plane for convenient viewing.

3,664,672

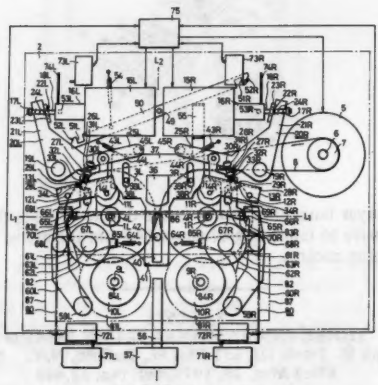
MAGNETIC RECORDING AND REPRODUCING APPARATUS

Sukeyoshi Fujikawa and Yasuhiro Uemura, Tokyo, Japan, assignors to Teac Corporation, Tokyo, Japan

Filed Dec. 19, 1969, Ser. No. 886,469
Claims priority, application Japan, Dec. 25, 1968, 43/94,663, 43/94,664; Apr. 3, 1969, 44/25,476, 44/25,477
Int. Cl. G11b *15/26*
U.S. Cl. 274—4 D 7 Claims

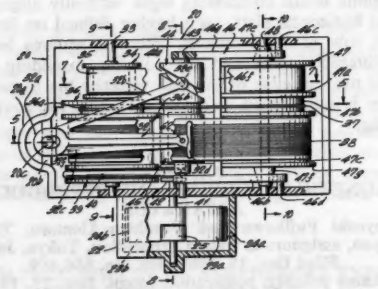
A magnetic recording and reproducing apparatus wherein a pinch roller mounted on a pinch roller arm is disposed into or out of rotational contact with a capstan

for transporting a magnetic tape unwound from a reel mounted on a reel shaft, with said magnetic tape being held between said pinch roller and said capstan, wherein when a plunger is energized, said pinch roller is brought into rotational contact with said capstan by means of a spring interposed directly or indirectly between an operating lever of said plunger and said pinch roller arm, with said magnetic tape being held between said pinch roller and said capstan, wherein an idler which is adapted to be disposed in and out of contact with a driving source



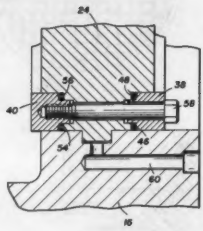
is brought into rotational contact with a reel shaft wheel provided on the reel shaft or the reel shaft is connected to the driving source through said idler and rotary frictional engagement means, and said idler and said rotary frictional engagement means are utilized as means for imparting a back tension to the magnetic tape and means for braking said reel shaft, and wherein the in-contact or out-of-contact relationship between said pinch roller and said capstan is secured by a locking mechanism associated with the operating lever of the plunger.

3,664,673
TAPE TALKING MECHANISM
Gerhart Weiss and Burt W. Ensmann, Flushing, N.Y., assignors to Ideal Toy Corporation, Hollis, N.Y.
Filed Nov. 18, 1969, Ser. No. 877,636
Int. Cl. G11b *25/06*; A63h *3/28*; G11b *17/06*
U.S. Cl. 274—11 R **6 Claims**



A miniature tape talking mechanism. The tape is supported by a rotatable capstan positioned below the stylus to minimize noise in the audible message. The capstan is made of metal so that its relatively large inertia prevents up-and-down movement of the capstan during play of the device in order that maximum vibrations be transmitted to the speaker cone. The tone arm element has two legs in the shape of a V. At the tip of one leg is the stylus for tracking a tape groove, and at the tip of the other leg is a cam follower for tracking a cam groove which is rotated during wind-up of the unit. The final position of the cam follower determines the message on the tape selected for play. The resilient tone arm element prevents jumping from track to track during a play of the device even if the mechanism is jarred. Either (or both) of the ends of the tape can be attached to a respective drum simply by folding it and inserting the folded end of the tape into a notch on the drum; this eliminates the need for a fastening element and reduces assembly time.

3,664,674
SPLIT HOUSING WITH IMPROVED SEAL
Frank A. Yehl, Allegany, N.Y., assignor to Dresser Industries, Inc., Dallas, Tex.
Filed Apr. 22, 1970, Ser. No. 30,729
Int. Cl. F16j *9/00*
U.S. Cl. 277—66 **7 Claims**



A split housing including improved sealing means forming a fluid-tight seal between a circular end member and a pair of mating semicylindrical housing or casing members. The improved housing/sealing arrangement includes an end plate, a split casing such as is utilized on high pressure, turbine-type compressors, an annular member carrying a deformable seal having a diameter less than the inner diameter of the casing and means for deforming the seal into sealing engagement with the end plate and casing.

3,664,675
SEAL BETWEEN ROTATING PARTS, MOVEMENT OF WHICH IS RELATIVE TO EACH OTHER
Sven-Erik Malmstrom, Reftele, Sweden, assignor to Forsheda Gummifabrik Aktiebolag, Forsheda, Sweden
Continuation-in-part of application Ser. No. 809,743, Mar. 24, 1969. This application May 5, 1971, Ser. No. 140,425
Claims priority, application Sweden, Apr. 1, 1968, 4,276/68
Int. Cl. F16j *15/32*
U.S. Cl. 277—84 **5 Claims**

A seal for relatively rotatable members such as a shaft member and a wall member having a sealing surface disposed generally transversely to the axis of the shaft member, comprising an annular body portion adapted to be

mounted on the shaft member, a flexible lip projecting angularly from said body portion and having at least one circumferential rib projecting from the lip engaging the sealing surface of the wall member and a plurality of fin-shaped elements projecting radially from said rib disposed generally parallel to the sealing surface, said fin-shaped elements adapted to press with a light pressure against the sealing surface with freely suspended side edges and which, due to friction upon relative rotation of the members, deflect rearwardly in relation to the direction of movement of the sealing rib and sealing surface thereby providing a pumping effect directed radially from the sealing rib.

3,664,676

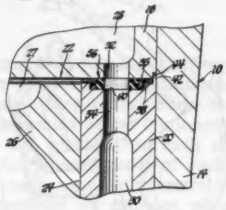
CYLINDER HEAD GASKET ASSEMBLY

Victor Petersen, Westmont, Ill., assignor to General Motors Corporation, Detroit, Mich.

Filed Sept. 11, 1970, Ser. No. 71,321

Int. Cl. F16j *15/10*

U.S. Cl. 277—166 **7 Claims**



In a preferred embodiment, a cylinder head gasket includes a thin annular sheet metal member having raised copper portions on its upper and lower surfaces adjacent the inner periphery to act as a combustion seal and having a plurality of coolant openings, each receiving a snap-in grommet. The grommets preferably comprise a soft elastomeric inner seal portion bonded or otherwise retained to a plastic resin base outer insulating portion. A peripheral groove adjacent one end of each grommet permits loose retention of the grommets within their respective openings of the sheet metal member such that upon installation of the gasket, the grommets may move laterally to seat squarely within counterbored portions surrounding the water passages of the associated cylinder liner.

3,664,677

TOOL HOLDER

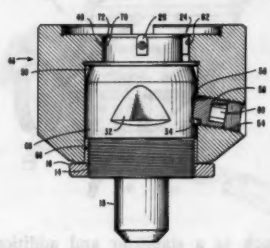
Elwin Sunderman, Inglewood, and Merle Hilliard, Los Angeles, Calif., assignors to Sonnet Tool and Manufacturing Co., Hawthorne, Calif.

Filed June 15, 1970, Ser. No. 46,229

Int. Cl. B23b *31/04*

U.S. Cl. 279—83 **13 Claims**

The tool holder is a generally cylindrical body with one end threaded and with a cylindrical concentric tail integrally attached to the opposite end. A bore for receiving the stem of a machine tool extends through the bore and the tail. A bead, semi-circular in cross-section, is formed on the opposite end of the cylindrical body adjacent the plane of the junction between the cylindrical tail and the cylindrical body. The region immediately adjacent the bead is relieved axially a distance on the order of a sixth of the diameter of the cylindrical body. The diameter of the beaded end of the cylindrical body is slightly smaller than the diameter of the cylindrical body for ease in penetrating the bore of the adapter and the relieved axially extending region prevents the tool holder from becoming jammed in the bore of the adapter. The cylindrical surface of the body and the cylindrical surface of the



tail are precision ground and then these surfaces fit into a correspondingly dimensioned bore and counter-bore in the adapter. In this way the tool holder is supported in the adapter on spaced bearing surfaces for greater stability.

3,664,678

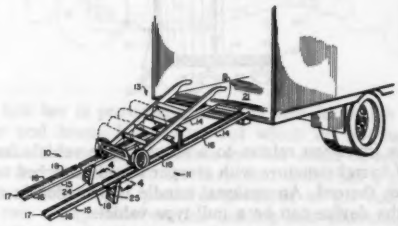
MATERIAL HANDLING APPARATUS

Benjamin van der Meide, 5296 South 2nd West, Murray, Utah 84107

Original application Apr. 16, 1968, Ser. No. 721,819, now Patent No. 3,532,058. Divided and this application June 8, 1970, Ser. No. 57,000

Int. Cl. B62b *1/08*

U.S. Cl. 280—47.2 **5 Claims**



A hand truck and track system for loading and unloading vehicle trucks and the like. The hand truck is provided with folding rest legs and can be fitted with either skid shoes having retarding surfaces or with roller means having brakes to automatically prevent reverse travel. The tracks are rails that provide selectively an untreated skid path and a path coated with a non-skid surfacing material for the skid shoes or rollers.

3,664,679

STABILIZING DEVICE FOR TRUCKS

Dale H. Hille, Bowling Green, Ohio, assignor to Dale H. Hille Company, Bowling Green, Ohio

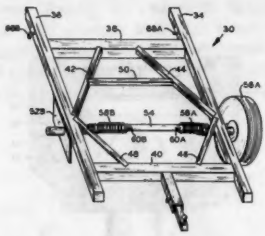
Filed Jan. 22, 1970, Ser. No. 4,850

Int. Cl. B60p *3/40*

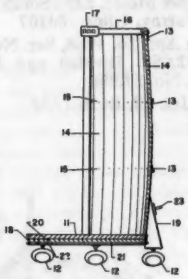
U.S. Cl. 280—81 R **4 Claims**

A stabilizing device for a truck which is a supplemental frame extension supported on wheels and attached, in combination, with the rearward portion of the main frame of the truck so as to be a rearwardly extending addition

to the main frame of the truck, this supplemental frame extension being positioned beneath the load carrying surface of the truck as a stabilizer and additional weight bearer.

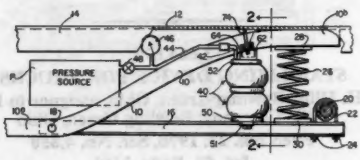


3,664,680
SCOOTER-TYPE VEHICLE
Jasper A. Booker, 29 Woodbury Forest Drive, Hampton, Va. 23366
Filed Aug. 18, 1970, Ser. No. 64,744
Int. Cl. B62b *3/00*
U.S. Cl. 280—87.04 R **3 Claims**



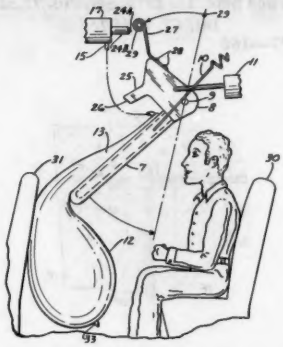
This invention relates to a scooter-type vehicle having a half-barrel structure with creeper wheels attached to the bottom thereof. An optional handle is provided in order that the device can be a pull-type vehicle.

3,664,681
AIR SPRING MOUNTING FOR PICKUP TRUCKS
Ellis B. Thaxton, Arlington, Tex., assignor to Ride-Rite Corp., Arlington, Tex.
Filed Dec. 4, 1970, Ser. No. 95,117
Int. Cl. B60g *11/56*
U.S. Cl. 280—124 F **6 Claims**



Mountings for auxiliary air springs to prevent overloading of the regular spring system of a vehicle of the type having longitudinal chassis frame members which are arched over the vehicle axle, which axle is supported on radius arms pivotally connected to the frame members ahead of their arched portions, the mountings compensating for non-parallel relationships between the frame members and the radius arms at the locations where the air springs are mounted, and the mountings being easily installed without requiring drilling of the vehicle structures.

3,664,682
COMBINED CRASH PAD AND AIR BAG FOR MOTOR VEHICLES
Casimir E. Wycech, 5941 Argyle, Dearborn, Mich. 48126
Continuation-in-part of application Ser. No. 41,841, June 1, 1970. This application July 15, 1970, Ser. No. 55,158
Int. Cl. B10r *21/10*
U.S. Cl. 280—150 AB **10 Claims**



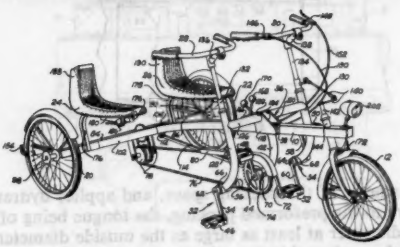
This application discloses a combined Crash Pad and Air Bag for motor vehicles, which is arranged to automatically move into protective position in front of the driver and passenger upon impact of the vehicle with another object at and above a pre-determined speed.

3,664,683
BASKET ATTACHMENT FOR TRICYCLE
Alan B. Gobby, Glendale, Ariz., assignor to Gobby Mfg., Inc., Glendale, Ariz.
Filed Nov. 28, 1969, Ser. No. 880,739
Int. Cl. B21j *9/00*
U.S. Cl. 280—202 **1 Claim**

A basket attachment mechanism for a tricycle having the usual steerable front wheel assembly, pedal-sprocket mechanism, and a rear axle assembly with contains the mechanism that transmits the driving force from the

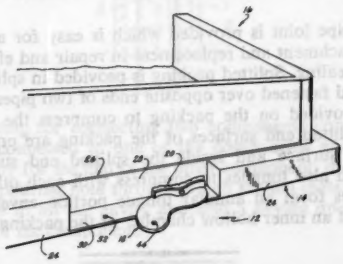
sprocket to at least one of the rear wheels which are journaled on opposite ends of the axle assembly. A demountable basket assembly is attached between the rear wheels and above the axle assembly.

3,664,684
TWO-PASSENGER CYCLE
Cyril E. Long, 3055 Hayes, Costa Mesa, Calif. 92626
Filed July 1, 1970, Ser. No. 51,429
Int. Cl. B62k 5/04
U.S. Cl. 280—231 13 Claims



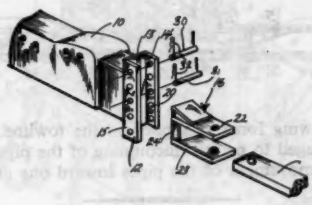
A two-passenger tricycle in which separate saddle and handlebars are provided on opposite sides of an axis defined by a medial, longitudinal frame member. A central crankshaft is journaled across the longitudinal axis and a set of pedals are provided on each side of the longitudinal axis. An inboard pedal of each set of pedals is connected by crank arms to the central crankshaft which, in turn, is connected by sprocket wheels and chain to a drive wheel. The medial seating surface of the saddles are spaced a greater distance horizontally from the axis of rotation of the crankshaft than vertically therefrom so that the horizontal thrust vector on the pedal is greater than the vertical thrust vector, allowing push pedaling. Other features include a novel brake control, rear mounting feet for vertical storage and knockdown construction.

3,664,685
CUSHION HITCH FOR VEHICLE BUMPERS
Elmer Ray Moline, 103 E. Railroad, Waterville, Kans. 66548
Filed Dec. 28, 1970, Ser. No. 101,612
Int. Cl. B60d 1/14
U.S. Cl. 280—486 5 Claims



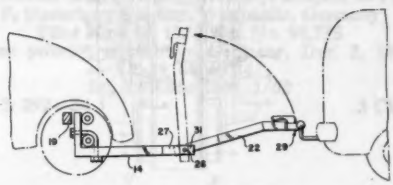
A cushion hitch for use with conventional rear safety bumpers for vehicles. Such hitch has a horizontal member and an adjacent vertical portion. There is a coupling pivotally mountable with the horizontal member, and having an attachment for trailer vehicles. A cushion is attached to the coupling to contact a bumper portion when mounted on the safety bumper and when the coupling is rotated.

3,664,686
TWO PIN ADJUSTABLE HITCH
Robert DuWayne Anderson, Murdock, Minn., assignor to TCI, Inc., Benson, Minn.
Filed July 28, 1970, Ser. No. 58,795
Int. Cl. B60d 1/02
U.S. Cl. 280—490 3 Claims



A quick adjustable hitch utilizing two removable pins that hold a hitch clevis stable with respect to a connecting channel, and which permits a wide range of vertical adjustment for the clevis in a convenient manner.

3,664,687
VEHICLE TOW BAR
Thomas O. Nutt, Jr., and Thomas O. Nutt III, both of 3536 Queen Anne Drive, Fairfax, Va. 22030
Filed Jan. 21, 1970, Ser. No. 4,589
Int. Cl. B62d 53/00
U.S. Cl. 280—491 6 Claims

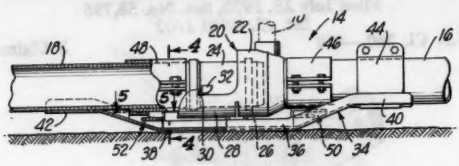


A tow bar is provided for towing vehicles which have upper and lower front axles but which do not have a frame or a bumper to which a tow bar could be secured. A tow bar according to the invention comprises a generally horizontal rigid platform provided at the rear end with two clamp members for holding and encircling the lower front axle of the towed vehicle. The rear end of the platform is also provided with two upstanding members which engage the upper axle and prevent the platform from rotating downwardly about the lower axle. The forward end of the platform is provided with means to connect the platform to a towing vehicle. The connecting means conveniently comprises an A-frame, the rear, wider, end of which is secured to the forward end of the platform and the forward end of which is connectable to the towing vehicle.

3,664,688
IRRIGATION TOWLINE ASSEMBLY
Wells D. De Loach, 3353 Rio Bonito, Covina, Calif. 91722
Filed July 6, 1970, Ser. No. 52,577
Int. Cl. F16l 37/00
U.S. Cl. 285—6 10 Claims

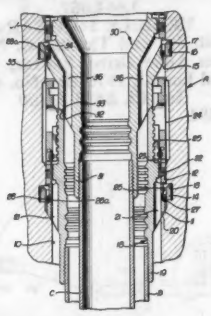
An irrigation towline assembly including a pair of water pipes releasably joined end to end by a sealed coupling having slidably interfitting parts with coacting thrust shoulders which permit limited relative axial movement of the parts, a coupler skid having a clamp at one end firmly clamping one pipe to the skid, and coacting lugs on the

other pipe and skid which engage to firmly anchor the pipe to the skid as a result of limited axial separation movement of the latter pipe relative to the clamped pipe



when a towing force is applied to the towline. The lugs are disengaged to permit uncoupling of the pipes by relative axial movement of the pipes toward one another.

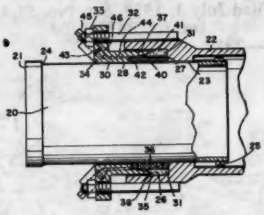
3,664,689
SELECTIVELY LOCKABLE CASING HANGER
James W. E. Hanes, Ventura, Calif., assignor to Vetco Offshore Industries, Inc., Ventura, Calif.
Filed Aug. 14, 1969, Ser. No. 850,194
Int. Cl. F16l *35/00*
U.S. Cl. 285—18 **8 Claims**



Casing hanger apparatus for hanging a well casing string from underwater well head apparatus, in which a lock ring engageable with a shoulder on the casing hanger, to lock the casing hanger in place, can be held from engaging the shoulder by a filler ring which is removably disposed on the casing hanger body. The filler ring is removed if the lock ring is to be permitted to function. Thus, the presence or absence of the filler means renders the lock ring selectively inoperable or operable, permitting easy removal of the casing hanger or its locking in place.

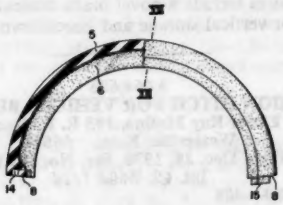
3,664,690
SLIP-TYPE EXPANSION JOINT AND PACKING JOINT
James W. Williams III, 705 Whites Road, Lansdale, Pa. 19446, and John S. Fetterolf, 750 Spruce St., Royersford, Pa. 19468
Filed Sept. 9, 1970, Ser. No. 70,639
Int. Cl. F16l *17/02*
U.S. Cl. 285—96 **6 Claims**

A packing joint has an inner circular member or sleeve, and an outer tubular member engaging the outside of the inner member or sleeve, slidable and telescoping with respect to the inner member, for example, as in a slip-type expansion joint. A stuffing box is at one end of the outer member, having an annular packing space between the inner and outer members open at one end, and a packing gland surrounds and engages the inner member and has a sleeve entering the packing space and enclosing the open end of the packing space. The gland is urged toward the packing space by suitable means such as screws. There is a preformed annular packing in the packing space which engages the inner member and extends in outside diameter substantially less than the outside diameter of the packing space. Plastic packing fills the packing space radially outside the preformed annular packing and in the recesses of the preformed annular packing. The gland, suitably by means of an annular tongue on the end, engages the out-



side diameter of the packing space, and applies hydraulic pressure to the preformed packing, the tongue being of an inside diameter at least as large as the outside diameter of the preformed packing, so that it does not bear directly on the preformed packing. The annular tongue preferably has an annular wedge surface on its radial inside adjoining its forward end. In a preferred embodiment pump means insert supplementing plastic packing, preferably at a plurality of points around the circumference.

3,664,691
PIPE JOINTS
Tomomi Nakamura, 11–17, 3-chome, Nishi-Ikebukuro, Toshima-ku, Tokyo, Japan
Filed May 15, 1970, Ser. No. 37,784
Int. Cl. F16l *17/04*
U.S. Cl. 285—112 **1 Claim**

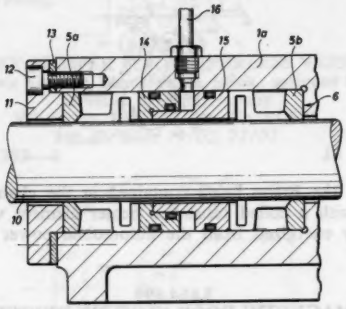


A pipe joint is provided which is easy for attachment or detachment and replacement in repair and effective for tight sealing. Splitted packing is provided in splitted housing and fastened over opposite ends of two pipes. Tongues are provided on the packing to compress the pipes. On the splitted end surfaces of the packing are provided inclined surface and inside the splitted end surfaces are formed also tongues to compress with each other. These tongues form an annular tongue portion enveloping the inlet of an inner hollow chamber of the packing.

3,664,692
DEVICE FOR MEASURING A CYLINDRICAL BODY
Rudolf Spieth, Kennenburger Strasse 40, D73 Esslingen am Neckar, Kennenburg, Germany
Filed July 29, 1970, Ser. No. 59,091
Claims priority, application Germany, July 29, 1969, P 19 38 449.7
Int. Cl. F16d *1/06*
U.S. Cl. 287—52 **5 Claims**

A device for securing a cylindrical body to a locating body comprising a locking ring having one annular groove

extending into it from its interior and one extending into it from its exterior, the locking ring being supported on a surface of the locating body in a manner whereby the exterior annular groove is adjacent such surface, and that of the locking ring which is adjacent the locating body abutting axially against the cylindrical body in such a manner that when the locking ring is tightened up, it re-

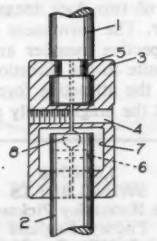


tains its position relative to the other parts of said locking ring. The intermediate outer portion of the ring between the grooves is displaced when the ring is tightened up and the locking ring section adjacent said locating body surface retains its position during the locking operation so that there will be no mutual displacement between the cylindrical body and the locating body.

3,664,693
COUPLINGS FOR CONNECTING TWO COMPONENTS

Brian Pemberton Gyles Irons, Birmingham, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Jan. 14, 1970, Ser. No. 2,904
Claims priority, application Great Britain, Jan. 24, 1969, 4,047/69
Int. Cl. F16d *1/00*
U.S. Cl. 287—111 **2 Claims**



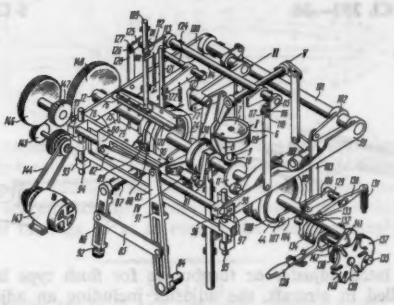
A couping for connecting two components comprising a sleeve connected to one of the components and defining a cavity for the end of the other component, the cavity having a pouring hole through which molten material can be poured to fill the cavity and also a keying opening in said end of the component.

3,664,694
APPARATUS FOR SEWING TOGETHER NET SHEETS

Manivald Maximovich Pajulaid, Roo 10, kv. 6 ulitsa, and Khugo Gustavovich Tooming, Ulitsa Waphu 8, kv. 24, both of Tallin, U.S.S.R.

Filed Sept. 16, 1970, Ser. No. 72,795
Int. Cl. B65h *69/04*
U.S. Cl. 289—18 **6 Claims**

A machine for sewing net sheets together includes a shuttle carrier having a shuttle for jointing thread. A device is provided for pulling a loop out of the shuttle and a device is provided for threading the loop taken therefrom through the meshes of the net sheets. Still further

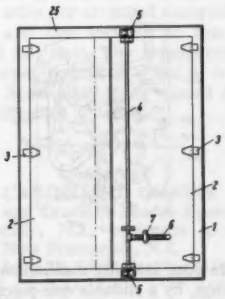


there is provided a mechanism for expansion of the loop and a mechanism for tightening the knot formed as a result of the shuttles passing through the loop.

3,664,695
TURNING BOLT LOCKING DEVICE FOR TRANSPORT VEHICLES

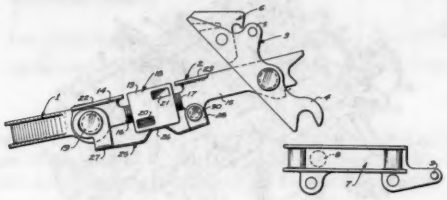
Hans-Werner Sickel, Hagen, Germany, assignor to Firma F. Hesterberg & Sohne, Westphalia, Germany

Filed Nov. 18, 1970, Ser. No. 90,715
Claims priority, application Germany, Dec. 3, 1969, P 19 60 697.4
Int. Cl. E05c *3/04, 7/02*
U.S. Cl. 292—54 **3 Claims**



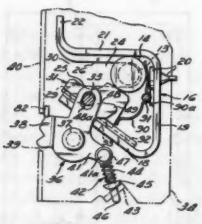
A turning bolt locking device for transport containers comprising a bolt provided at each end with eccentrically offset locking elements which during the locking turning movement tighteningly engage receivers affixed to the container frame, the locking element comprising an angularly recessed cylindrical body axially of the bolt and integrally formed with locking surfaces both at its upper and bottoms ends in the form at each such end of two cams of which the inside locking surfaces have a screw pitch, the axial distance between the cams corresponding to the axial distance between co-operating surfaces forming a corresponding screw thread in the receiver. The locking element may have surfaces that extend parallel in the axial direction and in the locking position make thrust transmitting contact with corresponding flat surfaces in the receiver.

3,664,696
LATCH ADJUSTER
Lloyd Richard Poe, Beverly Hills, Calif., assignor to Hartwell Corporation, Los Angeles, Calif.
Filed Jan. 15, 1971, Ser. No. 106,793
Int. Cl. E05c 5/00
U.S. Cl. 292—26 5 Claims



A latch adjuster or turnbuckle for flush type latches installed in aircraft, the adjuster including an adjusting member which is provided with opposed screwthreads, is square in cross section and is so mounted that each of its sides may occupy a position flush with the surrounding surface of the aircraft; each side being provided with tool receiving recesses accessible from the exterior of the aircraft for turning the adjusting member ninety degrees in either direction to expose a flanking side. Yieldable means engages the adjusting member to retain a side in its flush position.

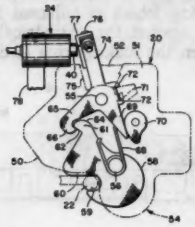
3,664,697
LATCH MECHANISM
Angelo R. De Vito, 1354 S. Belvoir Blvd., South Euclid, Ohio 44121, and Otto V. Puzik, 5600 Clairidge Drive, Willoughby, Ohio 44094
Continuation-in-part of application Ser. No. 634,271, Apr. 27, 1967, now Patent No. 3,507,530. This application Apr. 13, 1970, Ser. No. 27,879
Int. Cl. E05b 65/22
U.S. Cl. 292—173 3 Claims



An automobile door latching mechanism characterized, among other things, by a slidable one-piece contactor that is movable between working and idling positions in one or both of which it is capable of pivotal deflection. Incorporated in the mechanism are levers, preferably levers of the bell-crank type, at least one of which can initiate movement of the contactor between working and idling positions. The mechanism includes connections extending from one of said levers to an externally housed latch element adapted to cooperate with an external striker.

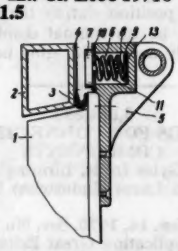
3,664,698
ELECTRIC ACTUATING MECHANISM
George P. Stropkay, Willoughby, Ohio, assignor to Product Design & Manufacturing Corp., Willoughby, Ohio
Filed Apr. 2, 1970, Ser. No. 25,175
Int. Cl. E05c 3/26, 13/00
U.S. Cl. 292—201 6 Claims

Electrically operated automobile latch mechanisms utilizing a linear actuator which develops operating force by the vaporization of Freon 113. The actuator includes a sealed chamber having a flexible annularly folded diaphragm which imparts movement to a linearly guided



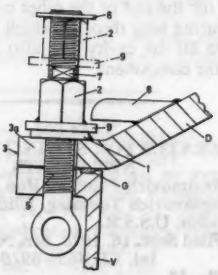
plunger, the Freon being contained in the chamber together with a coiled resistance heater element which is remotely energized from the automobile power source.

3,664,699
MAGNETIC DOOR CLOSURE DEVICE
Peter Weigelt, 4521 Bakum 156, Germany
Filed Mar. 12, 1970, Ser. No. 19,059
Claims priority, application Germany, Mar. 15, 1969, P 19 13 330.3
Int. Cl. E05c 19/16
U.S. Cl. 292—251.5 1 Claim



The present invention relates to a door closure device in which a permanent magnet is attached to one and a magnetically permeable member is attached to the respective other one of two door members movable relatively to each other. The permanent magnet is movably mounted in its respective member and resiliently urged in a direction opposite to the direction of its movement under the effect of the attractive force between the permanent magnet and the magnetically permeable member.

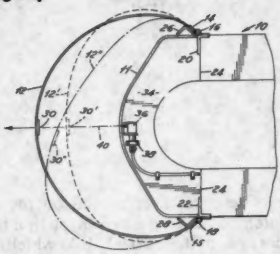
3,664,700
SWING BOLTS
Henry Maurice Hattersley Pickard, Stanningley, Pudsey, England
Filed Jan. 5, 1971, Ser. No. 103,987
Int. Cl. B65d 45/30
U.S. Cl. 292—256.75 3 Claims



Swinging of a swing bolt on the door of a pressure vessel to a release position is only possible when a secur-

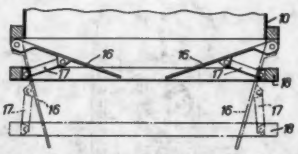
ing nut has been slackened sufficiently on the bolt to uncover a portion of the bolt formed with opposed flats which present a reduced diameter portion of the bolt which can pass through a restricted space when the bolt is swung. The door is also formed with a stop or lug which is engaged by said nut when commencing to slacken the nut to forcibly open the door should it "stick" and before the bolt is free to swing.

3,664,701
SAFETY BUMPER FOR DRIVERLESS VEHICLE
Louis Kondur, Birmingham, Mich., assignor to Jervis B. Webb Company
Filed Nov. 12, 1970, Ser. No. 88,634
Int. Cl. B60r *19/02, 21/02*
U.S. Cl. 293—4 **12 Claims**



A driverless self-propelled industrial vehicle is provided with a deflectable safety bumper and a vehicle stopping control which includes a photoelectric scanner on the vehicle and a reflector on the bumper to sense deflection thereof and automatically stop the vehicle when the bumper encounters an obstruction.

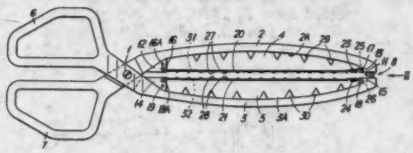
3,664,702
RELEASE MECHANISM
Eric Ambrose Hyde, Bromley, England, assignor to The British Iron and Steel Research Association
Filed May 21, 1970, Ser. No. 39,472
Claims priority, application Great Britain, May 27, 1969, 26,687/69
Int. Cl. B65c *13/00*
U.S. Cl. 294—69 **6 Claims**



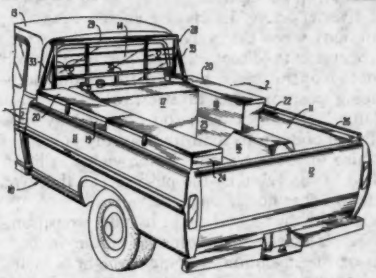
The invention concerns a scrap basket or pre-heater of the petal type. The basket or pre-heater of the invention is characterised in having a member coupled to the underside of the petals by way of link means and being movable towards and away from the body of the basket or pre-heater to effect opening and closing of the petals, and releasable means for holding said member in a position at which the petals will be closed.

3,664,703
FISH-HANDLING DEVICE
Billy D. Talley, 1A Victoria Circus, Glasgow, Scotland
Filed Nov. 20, 1970, Ser. No. 91,243
Claims priority, application Great Britain, Sept. 26, 1970, 45,974/70; Oct. 28, 1970, 51,115/70
Int. Cl. B25b *7/02*
U.S. Cl. 294—118 **9 Claims**

Hand tongs, especially for use in manipulating caught fish, whereof the pivotal jaws take the form of a pair of elongated legs together forming an elongated opening to receive the fish's body, gripping means being provided on the legs at the opposed longitudinal sides thereof to pierce the fish's body on closure of the legs so that slippage of the fish from between the legs is resisted, said gripping means consisting of elongated plates disposed in the opening side-by-side with the legs and lateral projections on the opposed faces of the plates, and said gripping means being spaced laterally from and resiliently yieldable towards the legs so as to engage the body yieldingly.

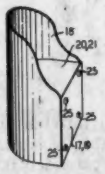


3,664,704
INTEGRATED ACCESSORY GROUP FOR PICK-UP TRUCKS
Clarence E. Ellis, P.O. Box 6, Red Rock, Okla. 74651
Filed Dec. 15, 1970, Ser. No. 98,358
Int. Cl. B60r *7/00*
U.S. Cl. 296—24 R **7 Claims**



Tool boxes, storage tanks, a cab protecting rack and other accessory units are arranged compactly in the pick-up truck body and tied together so that the accessory components will not shift. The arrangement is neat and compact and does not result in a loss of truck bed length or accessibility. Space sometimes wasted fore and aft of wheel wells is utilized to advantage.

3,664,705
CARDBOARD CHAIRS
Irwin L. Brody and Bruce S. Brody, Franklin Township, Somerset County, N.J., assignors to The Spencer-Mitchell Co., New Brunswick, N.J.
Filed June 18, 1969, Ser. No. 834,458
Int. Cl. A47c *1/12, 5/00, 7/00*
U.S. Cl. 297—445 **2 Claims**



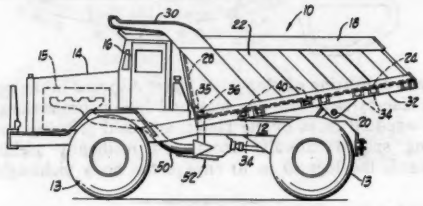
A chair having two parts each made of cardboard. The first part forms by means of a cylindrical surface the back, sides, and a portion of the base; the curve of the cylindrical surface being substantially perpendicular to the forces exerted by a person sitting in the chair. The second part completes the base structure and has a cylindrical surface whose curve is substantially perpendicular to the force exerted on the base by a person sitting in the chair.

3,664,706

EXHAUST DIVERTING VALVE FOR DUMPABLE VEHICLES HAVING HEATED DUMP BODIES

Leonard H. Chant, Euclid, Ohio, assignor to Euclid, Inc., Cleveland, Ohio

Filed June 3, 1970, Ser. No. 43,141
Int. Cl. B60h *1/18*
U.S. Cl. 298—1 H 6 Claims



A load carrying vehicle is disclosed which has an engine, an operator's cab, a dump body which is tiltable between a load carrying position and a dump position and an engine exhaust system communicating engine exhaust to the dump body for heating the dump body when in its load carrying position.

A diverter valve directs the engine exhaust gas to the dump body when the body is in its load carrying position and operates to direct exhaust gas to atmosphere away from the operator's cab when the dump body is in its dumping position. The diverter valve is operated by an actuator including a push rod operated by movement of the dump body to its load transporting position. The actuator also includes a spring which yields to limit the force applied to the valve by the push rod so that overtraveling of the rod does not damage the valve.

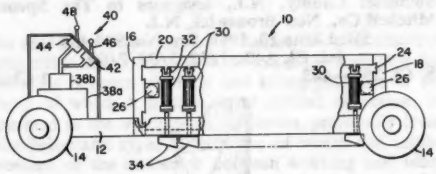
When the dump body is in its dump position, the valve member is biased to its other position. In one preferred form of the invention, a counterweight is included in the valve actuator for biasing a valve member. In another embodiment, the spring biases the valve member against the push rod.

3,664,707

PAVEMENT SLICER

Charles W. Fleigher, Stoneham, Mass., assignor of a fractional part interest to Lloyd M. Gordon, Newton Center, Mass.

Filed Aug. 5, 1970, Ser. No. 61,136
Int. Cl. E01c *23/09*
U.S. Cl. 299—38 14 Claims



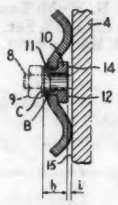
A slicer for slicing through large sections of asphalt or other readily cuttable pavement material comprises a wheeled body which carries two rows of cutting blades driven by hydraulic actuators. The blades extend longitudinally along the body and are aligned end to end with each other so that a continuous cut equal to the total longitudinal extent of the blades may be made. Each blade is individually forced against and through the pavement by a single hydraulic actuator so that the overall length of the cut, as well as its depth, can readily be controlled. The position of the blades is adjustable from side to side to control the width of the slice.

3,664,708

WHEEL ASSEMBLY

Henri Verdier, Beauregard-l'Eveque, France, assignor to Compagnie Generale des Etablissement Michelin raison sociale Michelin & Cie, Clermont-Ferrand, Puy-de-Dome, France

Filed June 2, 1970, Ser. No. 42,839
Claims priority, application France, June 6, 1969, 6918894
Int. Cl. B60b *3/16*
U.S. Cl. 301—9 DN 3 Claims



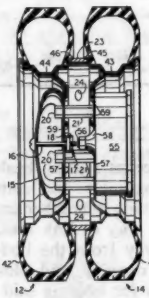
A casing or sleeve fits over a stud on the hub of the wheel of an automotive vehicle and through a hole formed in a dished portion of the wheel disk which projects in relation to the part of the disk that contacts the hub. A nut screwed onto the stud crimps the casing to the disk. The casing extends to a location near the hub but ordinarily does not touch the hub. When the nut is tightened to a certain point, thereby deforming the disk to some extent, the casing abuts the hub, preventing further deformation of the disk.

3,664,709

DUAL WHEEL ADAPTOR SYSTEM

Lester J. Barr'e, 2302 Shelter Island Drive, San Diego, Calif. 92106

Filed May 6, 1970, Ser. No. 35,156
Int. Cl. B60b *11/02*
U.S. Cl. 301—36 R 7 Claims



A dual wheel adaptor system for single tire vehicles uses stock wheels and fasteners to clamp an open ended torque ring between the confronting rim peripheries of the dual wheels on each side of the vehicle.

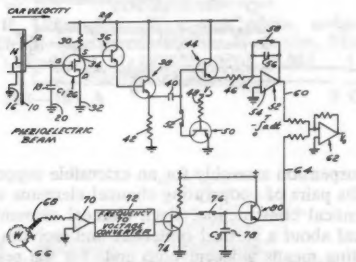
The edges of the torque ring are rounded to interfit with the radii of the engaged peripheries so that radially directed spring and clamping forces produce both frictional interlocking and concentric alignment of the inner and outer wheels resulting in a unitary drive, dual wheel traction unit.

Auxiliary fenders are added, as required.

3,664,710
RESILIENT HUB
Raymond B. Leach, Omaha, Nebr., assignor to Miracle Hub and Wheel, Inc.
Filed Dec. 4, 1969, Ser. No. 882,190
Int. Cl. B60b 9/02
U.S. Cl. 301—136 9 Claims

A resilient hub connecting a rotatable annular member to an axle incorporating a resilient biased slide member to enable relative lateral movement between the annular member and axle with such movement being cushioned by and resisted by the resiliently biased slide member.

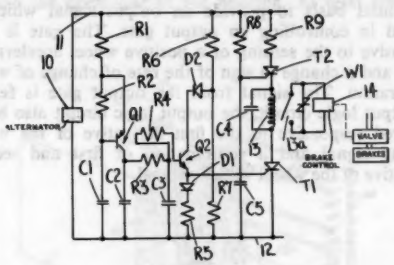
3,664,711
VEHICLE SPEED SYNTHESIZER
James I. Berry, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed Jan. 19, 1970, Ser. No. 3,666
Int. Cl. B60k 8/08
U.S. Cl. 303—21 BE 4 Claims



A speed synthesizer for measuring the translational velocity of a moving body at any instant during a period of acceleration or deceleration including an inertia sensor, suitable amplifiers and impedance buffers on the output side of the inertia sensor, a capacitor storage subcircuit receiving the output voltage signal of the impedance buffers and an integrator circuit adapted to receive and integrate the stored voltage potential in said storage subcircuit beginning at the instant the acceleration or deceleration mode begins.

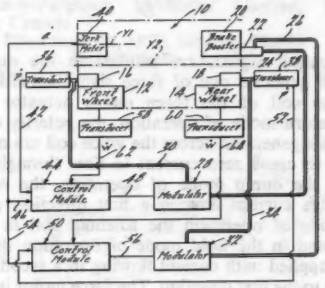
3,664,712
BRAKING SYSTEMS FOR VEHICLES
Leonard R. Hiscox, Birmingham, England, assignor to Girling Limited, Birmingham, England
Filed July 14, 1969, Ser. No. 841,251
Claims priority, application Great Britain, July 29, 1968, 36,031/68
Int. Cl. B60t 8/08
U.S. Cl. 303—21 CF 8 Claims

A braking system for vehicles, particularly rail vehicles, includes apparatus for applying braking force to a wheel. The speed of a wheel is sensed by a speed sensitive device, and the speed sensitive device operates a control device which reduces the braking pressure applied to the



wheel until the speed of the wheel falls to a predetermined value, at which point full braking force is applied.

3,664,713
SKID CONTROL SYSTEM UTILIZING VEHICLE DECELERATION
Hugh E. Riordan, Ann Arbor, and Frank L. Moncher, Farmington, Mich., assignors to Kelsey-Hayes Company, Romulus, Mich.
Filed Sept. 25, 1969, Ser. No. 860,960
Int. Cl. B60t 8/12
U.S. Cl. 303—21 P 6 Claims



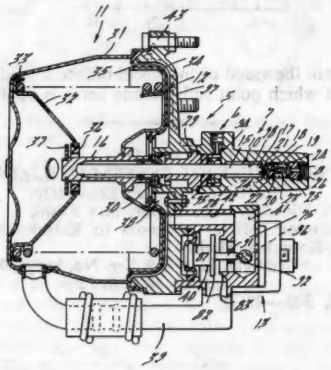
A skid control system for a wheeled vehicle utilizing vehicle deceleration to control brake pressure and including apparatus for measuring the rate of change of vehicle deceleration.

3,664,714
SKID CONTROL VALVE ASSEMBLY
Peter Every, Livonia, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich.
Filed Dec. 8, 1969, Ser. No. 883,166
Int. Cl. B60t 8/06
U.S. Cl. 303—21 F 23 Claims

A control system and force motor assembly for controlling the skidding of a vehicle under braked conditions when the control system provides a signal for controlling the position of an armature or fluid pressure controlling device in one of three conditions; the first condition being the "dump" mode of operation when the force motor is controlled to preclude braking pressure from being supplied to the wheels of the vehicle, the "hold" mode of operation when the braking force presented at the time the system goes into the "hold" mode of operation is maintained, and the "return" mode of operation when full applied braking pressure is returned to the vehicle wheels.

The control system is effectively responsive to a critical slip signal, the signal being generated in response to a

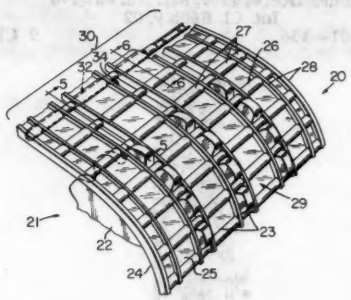
sensed difference between a hypothetical vehicle deceleration, as approximated by a decreasing ramp signal, and the vehicle wheel speed. This comparison is made on a differential basis to provide an output signal which is utilized in controlling an output gate. The gate is also responsive to the sensing of a positive wheel acceleration signal and a change in sign of the rate of change of wheel acceleration. The signal from the output gate is fed to an output logic circuit, the output logic circuit also being rendered responsive to the first derivative of the wheel velocity signal and a combination of first and second derivative of the wheel velocity signal.



The output signals are utilized in the output logic circuit to generate one of three signal conditions across the voice coil of the force motor actuator assembly. In the return mode of operation, the polarity of the output signals generated across the voice coil are of the same polarity to cause zero current to flow through the voice coil. In the dump mode of operation, the coil is provided with current flow in a first direction and in the hold mode of operation the solenoid coil in a first direction and in the hold mode of operation the solenoid coil is supplied with current flowing in a second direction opposite to the first direction. The force motor is fabricated with a three positioned armature which is adapted to be placed either in the return or deactuated position, where no signals are provided from the control circuit; a dump mode of operation which disconnects the manually actuated brake cylinder hydraulically to the wheel cylinders to provide reduced braking pressure; and the hold position which maintains the pressure being fed to the wheels at the time the hold position is achieved.

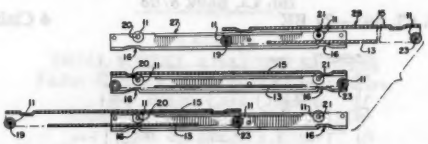
3,664,715
ENDLESS TRACK
Walter E. Huber, Springfield, Mo., assignor to Dayco Corporation, Dayton, Ohio
Filed July 9, 1970, Ser. No. 53,607
Int. Cl. B62d *55/24*
U.S. Cl. 305—38 **8 Claims**

An endless track of substantially uniform width is provided which is particularly adapted for use on motor driven vehicles such as snowmobiles, or the like, and such track has a plurality of reinforcing members embedded therein in equally spaced apart relation along the endless path of such track and each member has at least one exposed cylindrical portion extending therealong. A pair of openings extends through the track on opposite sides of each cylindrical portion with each pair of openings being adapted to receive an associated pair of teeth of a drive sprocket for the track therethrough enabling the track to be driven by direct engagement of sprocket teeth against the outside surfaces of the cylindrical portions and the openings are constructed to allow unobstructed engagement and disengagement by the drive sprocket teeth.



Improved reinforcing members for such a track are also provided together with an apparatus for and method of making such members.

3,664,716
DRAWER SUSPENSION
Ronald C. Johnson, Rochester, Minn., assignor to The General Fireproofing Company, Youngstown, Ohio
Filed Dec. 22, 1970, Ser. No. 100,658
Int. Cl. F16c *21/00*
U.S. Cl. 308—3.8 **9 Claims**

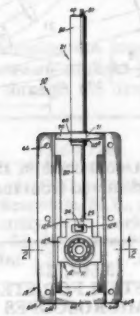


A suspension assembly for an extensible support device includes pairs of cooperating channel elements which are of identical construction. Each channel element is symmetrical about a vertical centerline and includes alternate mounting means adjacent both ends for the selective attachment of an anti-friction supporting element. In use, pairs of these channels are mounted in inverted relationships with a supporting element attached to each channel at opposed ends thereof.

3,664,717
TAKEUP APPARATUS
Buford Pendergrass, Wichita, and Quintin A. Applequist, Salina, Kans., and Alan H. Snyder, Jr., Dallas, Tex., assignors to Roberts Industries, Inc., Salina, Kans.
Filed July 15, 1970, Ser. No. 55,032
Int. Cl. F16c *35/02*; F16h *7/08*
U.S. Cl. 308—15 **14 Claims**

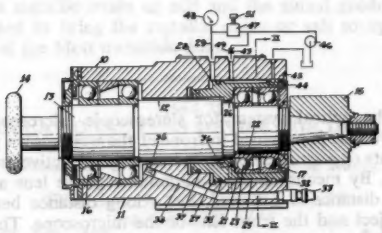
A takeup apparatus for adjustably supporting a bearing mounted pulley, sheave, sprocket, and the like for varying tension in a belt, chain, or similar flexible drive member. A bearing for supporting a shaft is mounted in a housing for longitudinal movement along a track in a frame. The bearing housing is connected with a piston rod of a hydraulic cylinder provided with a grease fitting and a bleed port. Grease is injected into the cylinder through the grease fitting by a grease gun to force the piston outwardly for moving the bearing to adjust belt tension. The

tension may be relieved by manipulating a needle valve controlling escape of grease from the cylinder through the bleed port to allow the piston to move into the cylinder relaxing the belt tension. Alternate forms of the device include a double acting piston which may be forced in either direction for controlled relaxing or increasing belt tension. Another form includes hydraulic cylinder



units mounted at opposite ends of the frame and connected with opposite ends of the bearing housing whereby the housing is forced in either direction by manipulation of the proper hydraulic cylinder. A further form of the apparatus includes a single acting cylinder with a spring return used for moving the bearing housing back toward the hydraulic cylinder for relaxing belt tension.

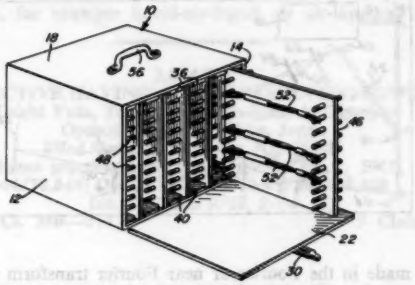
3,664,718
TOOLHEAD
Herbert R. Uhtenwoldt, Worcester, Mass., assignor to The Heald Machine Company, Worcester, Mass.
Filed Sept. 21, 1970, Ser. No. 74,001
Int. Cl. F16c *23/06*
U.S. Cl. 308—189 A **5 Claims**



This invention relates to a toolhead and, more specifically, to apparatus for mounting a spindle in anti-friction bearings and subjecting the bearings to a preload force.

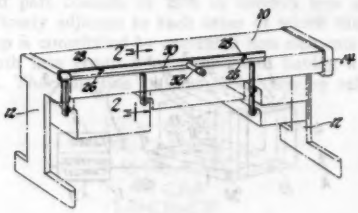
3,664,719
EMBROIDERY THREAD BOX
Edward J. Berg, 1005 Woodbury Drive, Newport, Minn. 55055
Filed Apr. 17, 1970, Ser. No. 29,454
Int. Cl. A47b *63/00*; A47f *3/06, 7/00*
U.S. Cl. 312—185 **1 Claim**

A housing including an open side with a plurality of generally planar members disposed within the housing and in spaced side by side parallel relation at generally right angles relative to the open side of the housing. The planar members are supported from the housing for individual edgewise extension and retraction relative to and through the open side of the housing. At least one side



of each of the planar members includes sets of spaced laterally outwardly projecting supports for removably supporting the opposite ends of a plurality of skeins therefrom.

3,664,720
DRAWER LOCKING SYSTEM
Werner E. Thomas, Elmira, Ontario, Canada, assignor to Massey-Ferguson Industries Limited, Toronto, Ontario, Canada
Filed Sept. 14, 1970, Ser. No. 72,054
Int. Cl. E05b *65/46*
U.S. Cl. 312—219 **9 Claims**

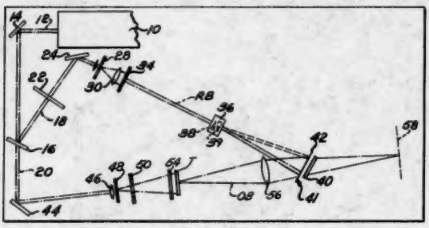


A locking system for desk drawers has a horizontal lock bar beneath the top and overlying drawers at the left, center and right of the desk. The lock bar is movable on inclined cam surfaces by a rotary lockable actuator. Each drawer has a vertically slidable detent biased upwardly and shiftable downwardly by the vertical component of the inclined motion of the lockbar.

3,664,721
DATA STORAGE AND RETRIEVAL METHOD AND APPARATUS
Howard N. Roberts, Ann Arbor, Mich., assignor to Radiation Incorporated, Palm Bay, Fla.
Filed Sept. 9, 1970, Ser. No. 70,855
Int. Cl. G02b *27/00*
U.S. Cl. 350—3.5 **6 Claims**

Holographic data storage and retrieval system in which holograms of data are made by deflecting a reference beam to different positions on a recording medium to sequentially interfere with object beams for different data with the objects of the object beams being imaged by a lens at an output plane beyond the recording medium. The area of the recording medium exposed to the object and ref-

erence beams is controlled to limit the area on the recording medium exposed to the object beam for each hologram in each array. A recording reference beam is of the same size as the limited area of recording. The recording

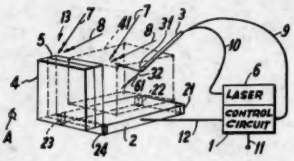


is made in the Fourier or near Fourier transform plane. On readout, the beam which is used as a reference beam on recording is used as the readout beam and is deflected to select the data to be read out. A real image of the data is formed at the output plane on the side of the hologram received from the light source.

3,664,722
THREE-DIMENSIONAL POSITION INDICATOR AND DETECTOR DEVICE

Kazuo Kiji, Nobuo Nishida, and Mitsuhito Sakaguchi, Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Minato-ku, Tokyo, Japan

Filed Sept. 22, 1970, Ser. No. 74,299
Claims priority, application Japan, Sept. 25, 1969, 44/75,804
Int. Cl. G02b *27/22*
U.S. Cl. 350—3.5 **4 Claims**



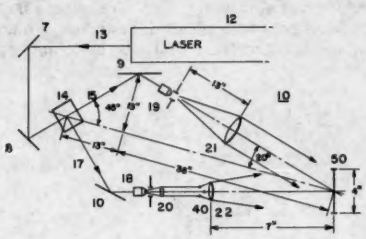
A three-dimensional indicator and detector includes a movable indicator and a device for generating digital signals corresponding of the indicator position. An image of a three-dimensional coordinate system is formed on a plate, and the locus of movement of the indicator in that system can be viewed through the hologram plate on a real-time basis.

3,664,723
MEANS FOR HOLOGRAPHICALLY RECORDING A THREE-DIMENSIONAL MICROSCOPIC SAMPLE

Louis S. Toth, Worthington, and Stuart A. Collins, Jr., Columbus, Ohio, assignors to The Ohio State University, Columbus, Ohio

Filed June 27, 1969, Ser. No. 837,208
Int. Cl. G02b *27/22, 21/06*
U.S. Cl. 350—3.5 **11 Claims**

A three-dimensional microscopic sample is recorded holographically consisting of a simultaneous record of every plane in the volume using a high numerical aperture but not necessarily perfect or abberation free lens. The volume sample is reconstructed using the same lens and is viewed using an ordinary microscope giving a virtually abberation-free reconstructed image of the volume. High magnification is possible because the fine

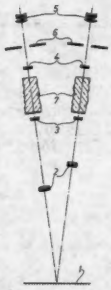


structure information contained in the high spatial frequencies of the light scattered from the sample is recorded and reproduced.

3,664,724
OPTICAL SYSTEM FOR STEREOSCOPIC MICROSCOPES

Walter Klein, Wissmar, Germany, assignor to E. Leitz GmbH, Wetzlar, Germany

Filed Feb. 24, 1970, Ser. No. 13,464
Claims priority, application Germany, Mar. 1, 1969, P 19 10 550.1
Int. Cl. G02b *21/00*
U.S. Cl. 350—54 **1 Claim**



In the optical system for stereoscopic microscopes a negative lens is provided in front of the well known prism elements or mirror elements between the objective and the ocular. By means of this additional negative lens a long object distance is achieved, i.e. a long distance between the object and the front lens of the microscope. The latter, however, can still be of relatively low overall height and compact design.

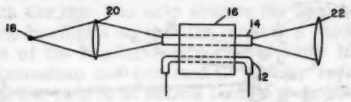
3,664,725
PHOTOCHROMIC GLASS

Charles C. Robinson, Sturbridge, and Elias Snitzer, Wellesley, Mass., assignors to American Optical Corporation, Southbridge, Mass.

Continuation-in-part of application Ser. No. 842,794, June 30, 1969, which is a continuation-in-part of application Ser. No. 490,918, Sept. 28, 1965. This application Oct. 30, 1970, Ser. No. 85,677
Int. Cl. G02f *1/28, 1/36*
U.S. Cl. 350—160 P **12 Claims**

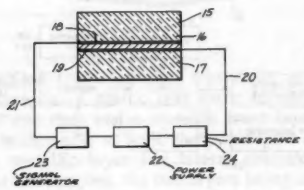
A device for controlling the transmission characteristics of a stream of light comprising a means for introducing a stream of light to be controlled, a rare earth

doped host glass having rare earth ions which exhibit excited state absorption at a wavelength corresponding to the wavelength of the stream of light to be controlled



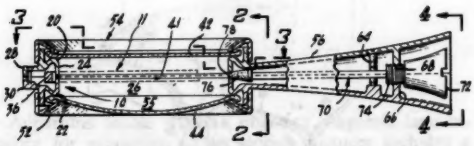
and a means for pumping the ions to an excited state for control of the stream of light by absorption as the light is transmitted through the device.

3,664,726
OPTICAL SHUTTER FOR LASER OR MASER MODULATION
Daniel C. Mattis, Scarsdale, N.Y., assignor to Yeshiva University, New York, N.Y.
Filed Oct. 21, 1969, Ser. No. 868,058
Int. Cl. G02f *1/36*
U.S. Cl. 350—160 **1 Claim**



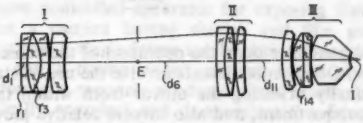
An optical shutter which is adapted to modulate a laser or maser or similar device is shown. The shutter includes a polyconducting device having a normally translucent member and a metallic oxide or metallic salt disposed thereupon. The metallic oxide or salt is adapted to undergo a Mott transition upon application of an impressed EMF by internal heating and is translucent below the Mott transition point but is reflective above this point. A signal generation device is coupled to the metallic oxide or salt and the singal produced is designed to bring the metallic oxide or salt to opposite sides of the Mott transition point.

3,664,727
EDUCATIONAL LENS DEVICE FOR DEMONSTRATING OPTICAL PRINCIPLES
Charles A. O'Donnell, 308 Aquetong Road, New Hope, Pa. 18938
Filed Sept. 9, 1970, Ser. No. 70,657
Int. Cl. G02b *3/12*
U.S. Cl. 350—179 **5 Claims**



An optical viewing device, designed for magnifying or reducing the image of objects viewed therethrough, includes a hollow body lens that assumes at the user's option any of a variety of concave or convex lens configurations. Between the lenses is a space that can be charged with either a liquid or a gaseous light-transmitting medium. The device thus becomes usable to particular advantage as an educational aid for demonstrating the phenomenon of magnification and other basic optical principles, in that the user, having selected a lens configuration, may then optionally select a sequence of ambient light-transmitting media separated by the spaced lenses, for example liquid-air-liquid, or air-liquid-air.

3,664,728
OBJECTIVE HAVING A HIGH RESOLVING POWER
Koichi Yuta, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan
Filed Sept. 30, 1970, Ser. No. 76,682
Claims priority, application Japan, Oct. 1, 1969, 44/78,049; Oct. 2, 1969, 44/78,437, 44/78,438
Int. Cl. G02b *9/62, 9/64*
U.S. Cl. 350—214 **9 Claims**



Objective having a high resolving power reaching Rayleigh limit, which comprises first to third parts beginning at the object side and spaced a distance from each other. The first part consists of a first and second lens groups of which the first lens group includes cemented three lens elements with its intermediate lens element being of a convex lens element while the second lens group is located closely adjacent to the first lens group. The second part consists of third and fourth lens groups at least one of which is constituted by cemented lens elements. The third part consists of fifth to seventh lens groups located closely adjacent to each other of which the sixth lens group is constituted by cemented lens elements while the seventh lens group is of a meniscus having a great thickness. The objective satisfies the following relationships:

$$1.2 > -r_3 > 0.8f$$
$$0.6f < r_{14} < 0.8f$$
$$0.4f < d_{11} < 0.8f$$
$$40f < |f_1|$$
$$1.2f < f_{II} < 3f$$

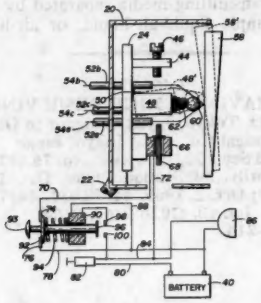
where:

f=the focal length of the entire system
f_I=the focal length of the first part
f_{II}=the focal length of the second part
r_3=the radius of curvature of the surface of lens element located at the third from the object side, wherein cemented surfaces are counted as being one surface
r_{14}=the radius of curvature of the surface of the lens element which is fourteenth from the object side, wherein cemented surfaces are counted as being one
d_{11}=the distance between the second and the third part.

3,664,729
AUTOMATICALLY ADJUSTABLE REAR VIEW MIRROR
Willis D. Moore, P.O. Box 392, Athens, Tex. 75751
Continuation-in-part of application Ser. No. 769,487, Oct. 22, 1968. This application Mar. 25, 1970, Ser. No. 22,612
Int. Cl. B60r *1/06*; G02b *7/18*
U.S. Cl. 350—281 **7 Claims**

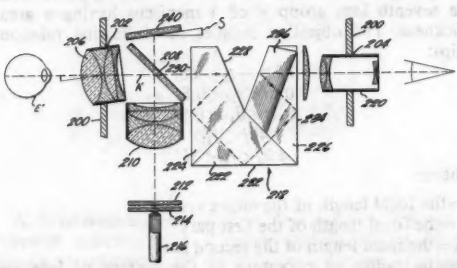
A vehicle rear view mirror assembly is disclosed which includes a mirror movable about a horizontal axis between a daytime operating position and a night anti-glare position. Structure which supports the mirror is movable

about a vertical axis between two extreme positions for varying the field of vision provided by the mirror. A solenoid moves the mirror about the horizontal axis in dependence upon the actuation of the vehicle headlights. Another solenoid moves the mirror about the vertical



axis in dependence upon the operation of the vehicle turn indicator. Other embodiments involve the use of structure for manually orienting the mirror from within the passenger compartment, and also involve relative movement between polarized transparent members for producing non-glare operation during night driving.

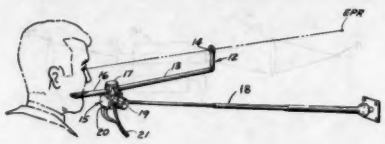
3,664,730
OPHTHALMOSCOPE
Hernando Cardona, 600 W. 115th St., New York, N.Y. 10025
Continuation-in-part of application Ser. No. 839,785, Jan. 21, 1969, which is a continuation-in-part of application Ser. No. 473,466, July 20, 1965. This application Oct. 15, 1970, Ser. No. 81,078
Int. Cl. A61b *3/12*; **G02b** *17/00, 5/04*
U.S. Cl. 351—6 **6 Claims**



An ophthalmoscope includes provision for correcting the image to provide an erect and unreversed image of the eye fundus which can be viewed along a direct line of sight. The correction of the image can be accomplished by the use of a roof prism. Provision is made for illuminating the fundus with light conducted to the case of the scope by a light-conducting cable.

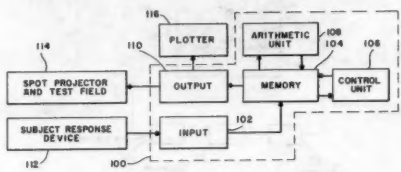
3,664,731
APPARATUS FOR DETERMINING EYE POINT-OF-REGARD
Henry R. Jex, Santa Monica, Calif., assignor to Systems Technology, Inc.
Filed Sept. 10, 1970, Ser. No. 71,054
Int. Cl. A61b *3/10*
U.S. Cl. 351—7 **19 Claims**

Apparatus for measuring the point-of-regard of the eye of an operator relative to a preselected local coordinate system. Sighting means is employed to either restrain or measure the eye point-of-regard relative to the orientation of the operator's head. Orientation of the operator's head is determined relative to a reference direction by means of a goniometer, one input end of which is adapted



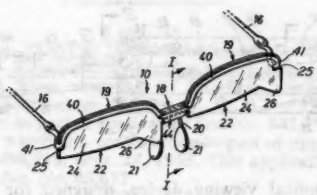
to be mounted relative to the operator's head. The other input end of the goniometer includes an extensible member adapted to be connected to a reference structure for providing the reference direction.

3,664,732
METHOD FOR EXAMINATION OF VISUAL FIELDS
John R. Lynn, 10001 Preston Road, Dallas, Tex. 75230
Filed Feb. 2, 1970, Ser. No. 7,601
Int. Cl. A61b *3/02, 3/10*
U.S. Cl. 351—39 **12 Claims**



A method for testing the visual field of a subject wherein stationary, momentary spots of light of predetermined stimulus value are presented at predetermined locations on a test field of constant brightness in a sequence not readily predictable by the subject. Information is obtained from the subject as to whether the subject perceived the stimulus as each spot was presented. Additional stationary, momentary spots of light are then presented at the predetermined locations in an unpredictable sequence with the additional spots being of predetermined stimulus values based upon the subject's responses to previous spots of light at the same locations. Additional stationary, momentary spots of light are presented until at each location either the limits of the apparatus are reached or a threshold level is determined.

3,664,733
ANTIDAZZLE SPECTACLES FOR MOTORISTS
Kurt-Ulrich Kalkowski, 3 Am Bleiberg, 5351 Kommern, Germany
Filed Feb. 17, 1971, Ser. No. 115,955
Int. Cl. G02c *7/10, 7/16*
U.S. Cl. 351—45 **7 Claims**



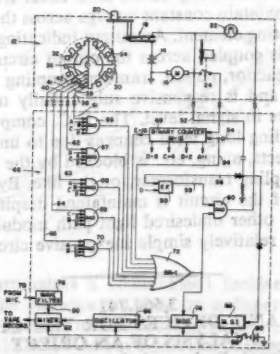
Antidazzle spectacles for use by motorists which includes a colored translucent strip of preferably flexible material which is fixedly attached to the spectacle rim

or can be held in clamping relation with the rim by a plurality of hooks attached to the strip and extending therefrom. The strip also includes a horizontal section, and at one end thereof a downwardly tapered section which extends away from the area of attachment of the strip with the rim. The strip absorbs the light beams of oncoming headlights so that the motorist's vision in the direction of the headlights is permitted while his vision in the immediate and intermediate vicinity remains unimpeded. The strip in its flexible form is preferably manufactured as a stamping.

3,664,734
COMPOSITE EYEGLASS FRAME
Andre Rivoire, Joinville, France, assignor to Lux-Optical, Paris, France
Filed Sept. 4, 1970, Ser. No. 69,665
Claims priority, application France, Sept. 11, 1969, 6930887; July 9, 1970, 7025518
Int. Cl. G02c *1/00*
U.S. Cl. 351—83 **9 Claims**

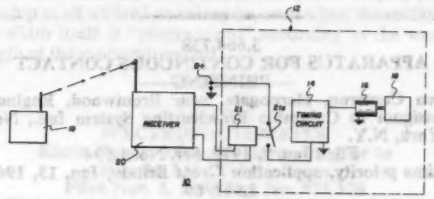
An eyeglass frame consists essentially of two juxtaposed layers, i.e. a plastic rear layer forming the interconnected eye rims and a metallic front layer extending over the bridge and at least the upper part of each eye rim. The metallic layer has lateral extensions forming hinged for the temples, the two layers being mechanically interconnected at these hingers and at the bridge.

3,664,735
DIGITAL ENCODING APPARATUS FOR THE SYNCHRONIZATION OF SEPARATE PICTURES AND SOUND RECORDS
Lenard M. Metzger, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed May 4, 1970, Ser. No. 34,195
Int. Cl. G03b *17/24, 21/52, 31/04*
U.S. Cl. 352—24 **11 Claims**



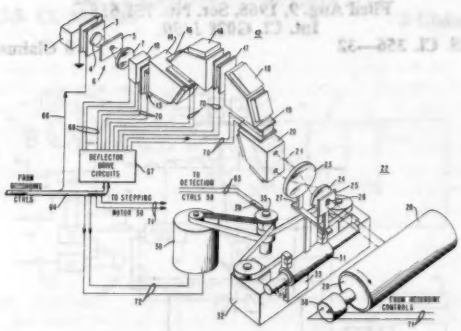
Apparatus usable with an ordinary magnetic tape recorder for preparing sound motion pictures includes a camera having means to code mark film, means to produce a sync pulse signal indicative of the camera speed, and a digital encoding device. An accessory device couples the camera and a tape recorder for applying matching scene identification codes to the tape sound track and to the film. A film speed code is also applied to the tape for synchronized playback.

3,664,736
SINGLE-FRAME FILM APPARATUS
Vernon H. Jungjohann and John D. Hagin, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed May 18, 1970, Ser. No. 38,086
Int. Cl. G03b *17/46, 21/38*
U.S. Cl. 352—84 **8 Claims**



Remote controlled apparatus for exposing film frames includes a camera having shutter and film pull-down mechanisms, a single-frame mechanism driven by a drive motor, and a timing circuit adapted to be placed into operation by a remotely produced signal which thereafter periodically energizes and de-energizes the drive motor. The single-frame mechanism provides for uniform exposure of successive film frames, regardless of drive motor speed. More particularly, the single-frame mechanism includes a first rotatable member which is directly driven by the motor and is adapted to wind a spring. The spring engages a latched second rotatable member which is released when the first member has wound the spring to where it has a predetermined stored energy. Thereafter, the spring rotates the second member which, in turn, drives the shutter during film exposure. After a film frame is exposed, there is a positive drive connection between first and second members which may come into play, thereby permitting the motor to directly drive the film pull-down mechanism.

3,664,737
PRINTING PLATE RECORDING BY DIRECT EXPOSURE
James Lipp, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Mar. 23, 1971, Ser. No. 127,094
Int. Cl. G03b *27/70*
U.S. Cl. 355—18 **12 Claims**



A laser beam in the actinic region of electromagnetic spectrum is used to provide direct exposure of printing plates. The plates have a coating of a photosensitive medium, preferably a diazo, which is sensitive to the actinic wavelength. The vertical deflection of the laser beam is controlled by digital light deflection apparatus

which provide a raster of discrete, essentially diffraction-limited spots of light along a single line.

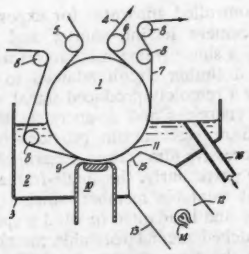
In the preferred embodiment, the particular beam trace on the photosensitive medium is determined by computer control of the digital light deflector; and horizontal displacement of the vertical lines transversely on the photosensitive medium is accomplished by light coupling means which reciprocates across the plane of the medium.

3,664,738

APPARATUS FOR CONTINUOUS CONTACT PRINTING

Ewen Cameron, Herongate, near Brentwood, England, assignor to Columbia Broadcasting System Inc., New York, N.Y.

Filed Jan. 9, 1970, Ser. No. 1,594
Claims priority, application Great Britain, Jan. 13, 1969, 1,941/69
Int. Cl. G03b *27/20*
U.S. Cl. 355—87 **13 Claims**



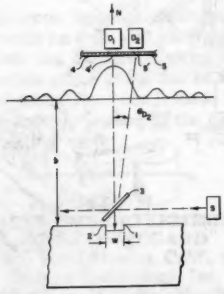
Apparatus and method for contact printing which comprises moving a transparency web and a web of photosensitive print material together in close contact and at a substantially uniform speed past an exposure position at which the print material is exposed to light passing through the transparency web, providing a liquid layer between the webs to establish optical contact between them, and applying fluid pressure to press the webs together, the fluid pressure being greatest at a position where the webs have been brought together via the liquid layer and before they have reached the exposure position.

3,664,739

METHOD AND DEVICE FOR MEASURING STRAIN AND OTHER CHANGES IN DIMENSION

Timothy R. Pryor, 5423 York Lane, Bethesda, Md. 20014

Filed Aug. 9, 1968, Ser. No. 751,615
Int. Cl. G02f *1/30*
U.S. Cl. 356—32 **8 Claims**



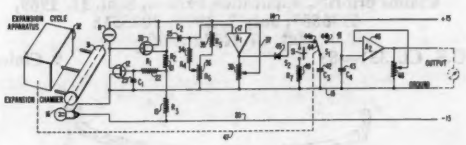
The separation of two points, each located on a member and being separated by an aperture, is measured by directing waves, such as light waves, on the points to form a diffraction pattern of the single aperture type. A change in dimension of the member, or in the spacing between two adjacent members, causes the separation of the edges to change which, in turn, causes a change in the configuration of the pattern. By comparing the intensity of a given portion of the pattern with a portion of a pattern produced under known conditions, a change in the separation of the points can be determined from which measurement of dimension, strain, etc., can be determined.

3,664,740

SELF ADJUSTING-SHORT PULSE DETECTING AND AMPLIFYING CIRCUIT

Theodore A. Rich, Scotia, N.Y., assignor to Environmental Technology Incorporated, Latham, N.Y.

Filed July 10, 1969, Ser. No. 840,775
Int. Cl. G01n *1/00, 15/02, 21/00*
U.S. Cl. 356—37 **25 Claims**



A self-adjusting detecting and amplifying circuit is described for use with electrically operable detecting elements such as a cadmium sulphide photo conductor for sensing short term changes in a physical phenomenon such as a light pulse that goes from a first condition or level of intensity to a second different condition or level of intensity as distinguished from longer term changes in operating condition of the detecting element due to temperature effects, aging, dust or dirt in the optical path to the photo conductor, etc. A field effect transistor is connected in series circuit relationship with a photo conductor detecting element and the series circuit thus comprised is connected across a source of electrical energy. An output circuit is connected across the photo conductor and is responsive to both long and short term changes in operating condition of the detecting element. A feedback circuit comprising a resistor-capacitor network having a long RC time constant is coupled between the output circuit and the input to the field effect transistor for controlling its conductivity. The feedback signal is adjusted so as to control the conductivity of the field effect transistor in a manner to maintain constant voltage across the photo conductor detecting element. An output indicating means such as a meter is coupled across the output circuit through a coupling capacitor, pulsed, transient coupling transformer, or the like and is responsive substantially only to short term changes in signal level. The D.C. component of the signal including long term changes due to undesired temperature effects, aging, etc. is blocked by the coupling capacitor, coupling transformer, or the like. By this means, sensitivity of the circuit is maintained despite dust accumulation or other undesired light path modulating effects with only a relatively simple inexpensive circuit.

3,664,741

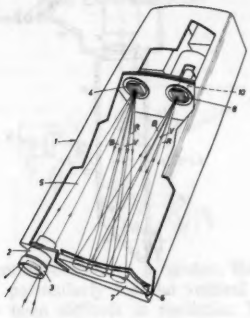
METHOD AND DEVICES FOR THE CHROMATIC ANALYSIS OF AN OBJECT

Maurice Bonnet, Paris, and Georges Courtes, Marseille, France, assignors to Etablissement Public: Agence Nationale de Valorisation de la Recherche "Anvar," Hauts-de-Seine, France

Filed Dec. 23, 1969, Ser. No. 887,488
Claims priority, application France, Dec. 27, 1968, 181,027
Int. Cl. G01j *3/20*
U.S. Cl. 356—74 **9 Claims**

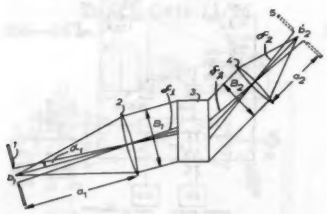
A method for the chromatic analysis of an object including focusing a beam of light from the object onto a

concave diffraction grating where an image is formed, the beam is then directed to a masked spherical mirror having at least one aperture therein, which thereby selects at least one band of wavelengths which is reflected onto a receiving surface. A chromatic analysis device for television has three apertures in the mask corresponding to the primary colors and the image is reconstituted on



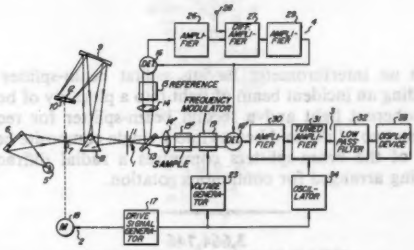
the screen of an electron beam tube. A plurality of lenses are disposed between the masked mirror and the screen for focusing the reconstituted image thereon. The device may be used for spectrophotometry wherein the focusing device employed is an apertured diaphragm with a spherical mirror. Throughout, the focusing device and the masked mirror are located on the Rowland circle of the diffraction grating.

3,664,742
MONOCHROMATOR SLIT SYSTEMS
Wolfgang Witte and Herbert Stenz, Uberlingen, Germany, assignors to Bodenseewerk Perkin-Elmer & Co. GmbH., Uberlingen (Bodensee), Germany
Filed May 6, 1970, Ser. No. 35,138
Claims priority, application Germany, May 6, 1969, P 16 23 005.8
Int. Cl. G01j *3/04, 3/18*
U.S. Cl. 356—80 **9 Claims**



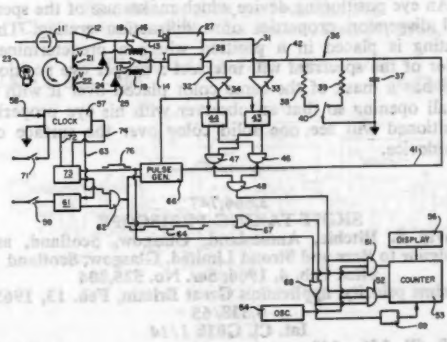
In monochromators a (collimated) incident radiation beam from the entrance slit falls on a dispersion means and leaves as monochromatic beams, having (in general) a different width. In non-symmetrical monochromators, the greatest radiant flux intensity at a given predetermined resolution is obtained when the ratio of the exit slit width to the entrance slit width is equal to: the incident beam width divided by the width of that monochromatic dispersed beam which will reach the exit slit, this fraction multiplied by the ratio of the effective image distance of the entrance slit image (formed at the exit slit plane) divided by the effective object distance of the entrance slit. A mechanical linking of the entrance and exit slits is disclosed for satisfying the above relationship for a single wavelength (near the middle of the wavelength range utilized). More complex but more perfectly corrected monochromator slit systems would maintain this slit width relationship at (a) all wavelengths over which the monochromator is used; and (b) for all slit widths desired to be used. An embodiment of a complete slit-controlling system provides changes in the relative widths of the entrance and exit slits to maintain the above desired relationship at all utilized wavelengths, even when the entrance slit width itself is "programmed" according to the wavelength of the monochromator.

3,664,743
SPECTROPHOTOMETER
Kimio Kanda, Mito-shi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan
Filed Nov. 3, 1969, Ser. No. 873,328
Claims priority, application Japan, Nov. 4, 1968, 43/79,964
Int. Cl. G01j *3/42*
U.S. Cl. 356—83 **8 Claims**



A spectrophotometer in which a light to be directed to a detector is scanned and at the same time it is modulated in frequency corresponding to the wavelength of the light to be scanned, thus an angular frequency of an electric signal taken out from said detector corresponding to the modulation is made to be selected.

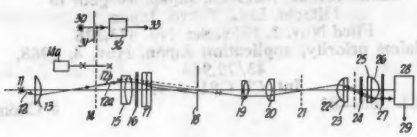
3,664,744
LOG RATIO CIRCUIT FOR DOUBLE BEAM SPECTROPHOTOMETERS
Max D. Liston, Irvine, Calif., assignor to Smith Kline Instruments, Inc., Palo Alto, Calif.
Filed Sept. 2, 1969, Ser. No. 854,647
Int. Cl. G01j *3/42, 1/10;* G01n *21/20*
U.S. Cl. 356—88 **2 Claims**



A ratio meter for giving the log of the ratio of two voltages. An RC circuit is charged and allowed to exponentially discharge. Comparator means receive the two

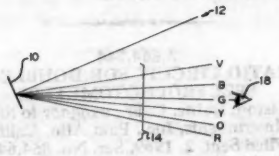
voltages and the voltage of the RC circuit and provide output signals when each of the two voltages is equal to the voltage of the RC circuit. The time lapse between said two signals corresponds to the log of the ratio of the two voltages.

3,664,745
INTERFEROMETER
Francis Hughes Smith, York, England, assignor to Vickers Limited, London, England
Filed Apr. 23, 1970, Ser. No. 31,246
Claims priority, application Great Britain, Apr. 23, 1969, 20,848/69
Int. Cl. G01b 9/02; G02b 21/06
U.S. Cl. 356—113 **32 Claims**



In an interferometer having a first beam-splitter for dividing an incident beam of light into a plurality of beams of coherent light and a second beam-splitter for recombining two of the said beams into a single composite beam, one of the beam-splitters comprises a radial diffraction grating arranged for continuous rotation.

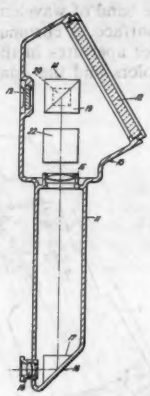
3,664,746
HEAD POSITIONING DEVICE
Robert A. McKnight, Binghamton, N.Y., assignor to The Singer Company, New York, N.Y.
Filed Aug. 19, 1970, Ser. No. 64,949
Int. Cl. G01b 11/26
U.S. Cl. 356—138 **8 Claims**



An eye positioning device which makes use of the spectral dispersion properties of a diffraction grating. The grating is placed in a position where a predetermined color of the spectrum will intersect a proper eye position and has a mask of the same color placed over it with a small opening so that an observer with his eye properly positioned will see one solid color over the surface of the device.

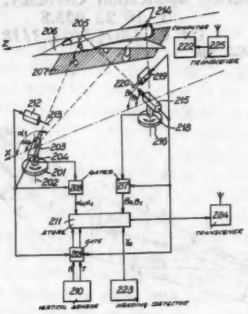
3,664,747
SIGHT-TAKING PERISCOPE
David S. Ritchie, Anniesland, Glasgow, Scotland, assignor to Barr and Stroud Limited, Glasgow, Scotland
Filed Feb. 4, 1966, Ser. No. 525,804
Claims priority, application Great Britain, Feb. 13, 1965, 6,328/65
Int. Cl. G01b 1/14
U.S. Cl. 356—140 **9 Claims**

A sight-taking periscope which has a head including a viewing window and a pair of sight-taking prisms mounted on a common horizontal axis and independently rotatable thereabout, an angular scale of altitude rotatable with one of the prisms and a scale reading optical system rotatable



with the other prism to permit measurement of the angle between the lines of sight of the prisms.

3,664,748
DEVICE FOR AUTOMATICALLY SETTING THE INITIAL HEADING ABOARD CRAFT UTILIZING GYROSCOPIC NAVIGATION SYSTEM
Maurice Bezu, Croissy, France, assignor to Société d'Etudes et de Realisations Electroniques, Asnieres, Hauts-de-Seine, France
Filed Jan. 22, 1970, Ser. No. 4,953
Claims priority, application France, Jan. 31, 1969, 6902012, 6902013; Mar. 13, 1969, 6907054; Mar. 24, 1969, 6908535; Apr. 10, 1969, 6910997
Int. Cl. G01b 11/26
U.S. Cl. 356—152 **22 Claims**



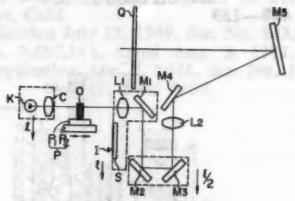
A device for rapidly ascertaining with great accuracy, by triangulation, the orientation of a stationary movable object in relation to a reference direction and more particularly for ascertaining the heading of an aircraft, characterized by the fact that it includes ground-based means for detecting two markers fixed to the aircraft and defining the longitudinal axis or flight axis thereof, means associated to these detection means and determining the angles at which the aircraft markers are seen by said detection means, a store for registering said angles and computer means which upon acquiring these angle values after interrogating said store solve an equation for determining the aircraft heading.

3,664,749

CONTOUR PROJECTOR HAVING AN OPTICAL SYSTEM WHICH MOVES IN A VERTICAL DIRECTION TO DETERMINE THE VERTICAL DIMENSIONS OF A SPECIMEN

Toshifumi Imai, Kawasaki, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Apr. 17, 1970, Ser. No. 29,526
Claims priority, application Japan, May 9, 1969, 44/35,616
Int. Cl. G02b 9/08
U.S. Cl. 356—164 5 Claims



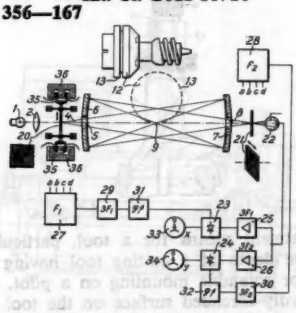
In a conventional contour projector, the accuracy of measurement, particularly for the vertical dimension of an object has been difficult to maintain. This invention provides an improved method for the aforementioned measurement. In this invention, neither the stage nor the whole optical system of the contour projector are moved vertically for the object. On the contrary, measurement of the vertical dimension about the object is carried out by the vertical movement of a part of the whole optical system, that is, the illumination system, projection system, reflecting system, and scale, etc. are moved, in unison, about the object. Therefore the object to be measured is held stationary, and the movement of a light weight moving part assures a higher order of mechanical accuracy. Optical error which is caused by mechanical play is completely eliminated by the selection of suitable construction.

3,664,750

OPTICAL APPARATUS FOR MEASUREMENT OF A SPATIAL FUNCTION

Fromund Hock, Wetzlar, Germany, assignor to Ernst Leitz G.m.b.H., Wetzlar, Germany

Filed June 29, 1970, Ser. No. 50,425
Claims priority, application Germany, July 3, 1969, P 19 33 719.0
Int. Cl. G01b 11/26
U.S. Cl. 356—167 14 Claims



Optical apparatus for measurement of a spatial function, e.g. the position of workpieces wherein the measurement is carried out by the following steps:

(a) Determining the distribution of the interference function in the measuring field;

(b) Fixing a time position correlation for the periodic measuring scan;

(c) Conducting periodic scanning cycles in the scanning field, determining the signal components caused by the scanning and defining the properties of the frequency suppression filter connected after the signal scanning apparatus, wherein the filter suppresses the Fourier components of the output signal of the scanning apparatus containing the information regarding the interference field;

(d) Connecting the filter defined by step (c) after the scanning device; and

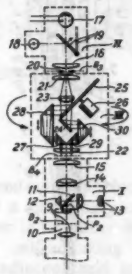
(e) Conducting the periodic measuring scan proper and evaluating the filtered signals obtained thereby.

3,664,751

ACCESSORY FOR MICROSCOPES FOR USE AS A TWO-BEAM PHOTOMETER

Karl Heinz Haas, Wetzlar, Germany, assignor to Ernst Leitz G.m.b.H., Wetzlar, Germany

Filed Mar. 23, 1970, Ser. No. 21,721
Claims priority, application Germany, Mar. 27, 1969, P 19 15 680.0
Int. Cl. G01j 1/42; G02b 21/06
U.S. Cl. 356—219 10 Claims



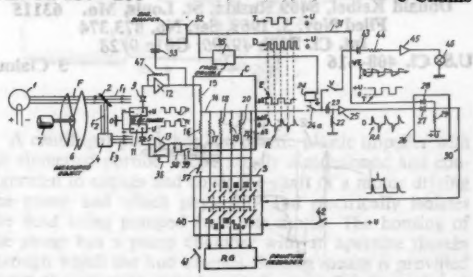
An accessory for microscopes comprises a diaphragm and a light source at one side thereof for illuminating the same. A beam splitter is provided at the other side of the diaphragm for dividing a light beam from the microscope eyepiece into a measuring light beam and an observation light beam. Means are provided between the beam splitter and the diaphragm for forming an image of the diaphragm alternately via each of two optical paths in a plane conjugate with the diaphragm and coincident with the focal plane for a light beam from the microscope eyepiece. With the beam splitter are optical means associated for imaging the diaphragm aperture in the focal plane of the observation light beam.

3,664,752

PHOTOELECTRIC MEASURING DEVICES

Max R. L. Hermieu, Paris, France, assignor to Machines Automatiques Modernes, Paris, France

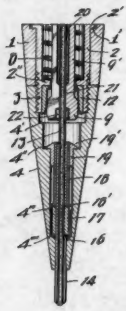
Filed Dec. 9, 1969, Ser. No. 883,376
Claims priority, application France, Dec. 27, 1968, 181,096
Int. Cl. G01j 1/42, 5/52; G01n 21/22
U.S. Cl. 356—206 6 Claims



Photoelectric measuring device comprising means for transmitting a light beam and two photoelectric cells,

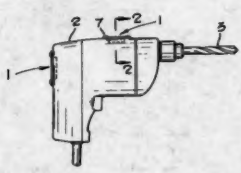
one constituting a reference photocell and the other a measuring photocell, means for modulating said light beam, said cells delivering modulated signals of opposed polarities to a comparator connected to a resistance-capacity circuit for detecting the resultant modulated voltage, and co-acting with an AND circuit actuating a selector for controlling said comparator, whereby the measurement results from the cancellation or the phase reversal of the modulated signals.

3,664,753
PUSHBUTTON TYPE MECHANICAL PENCIL
Tatsuzo Minagawa, 637 Tabata-cho, Kitaku, Tokyo, Japan
Filed July 10, 1970, Ser. No. 53,791
Claims priority, application Japan, July 18, 1969, 44/68,304; Aug. 14, 1969, 44/77,602
Int. Cl. B43k *21/16, 21/20*
U.S. Cl. 401—65 **7 Claims**



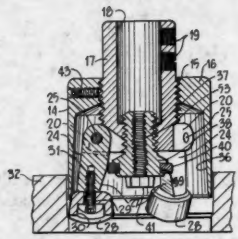
A pushbutton type mechanical pencil comprising an outer holder main body, an inner cylindrical holder member stationarily disposed within said outer main body, a tip member connected to said inner cylindrical holder member at the lower end of the latter, a lead guide tube slidably received within said tip member, an elastic member disposed around said lead guide tube for holding a lead in slight frictional engagement with said lead guide tube, a depressible lead pusher member received in said outer holder main body at the top thereof, a chuck operatively connected to said pusher member and adapted to grip said lead and lead guide tube, and a clutch received in said inner holder member for gripping and releasing said chuck, said chuck having a lead passage and an axially aligned recess which is adapted to grip the upper portion of said lead guide tube.

3,664,754
HAND DRILL ALIGNMENT DEVICES AND METHODS OF MAKING AND USING THE SAME
Donald Kelbel, 5469 Ruskin, St. Louis, Mo. 63115
Filed Nov. 3, 1969, Ser. No. 873,374
Int. Cl. B23b *49/00;* **G01c** *9/28*
U.S. Cl. 408—16 **3 Claims**



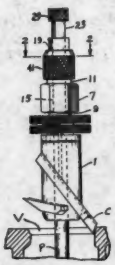
The present invention relates to bubble type alignment devices for use in upon and with hand drills comprising bubble type level chambers appropriately shaped and operably mounted to a conventional hand drill allowing a first such level which is aligned parallel to the drill bit and a second such level which is aligned perpendicular to the first.

3,664,755
FINISHING BORING HEAD
Leroy J. Carns, Castro Valley, Calif., assignor to The Singer Company, New York, N.Y.
Filed Dec. 2, 1970, Ser. No. 94,306
Int. Cl. B23b *29/034*
U.S. Cl. 408—159 **10 Claims**



A cutting head for reaming circular apertures to close tolerances. A cluster of three equiangularly spaced truncated conical cutters are mounted for adjustment within a cylindrical supporting head. The cluster is adjustable axially of the head to control the inside diameter of the apertures and each cutter of the cluster is adjustable by rotation thereof to expose a new cutting edge as required.

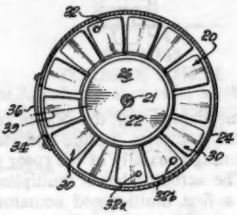
3,664,756
TOOL DEPTH CONTROL ADJUSTMENT
Joe S. Wells, deceased, late of Colorado Springs, Colo., by Mary Lou Wells, executrix, 1120 Clinton Way, Colorado Springs, Colo. 80907
Filed Dec. 24, 1969, Ser. No. 887,974
Int. Cl. B23b *39/14*
U.S. Cl. 408—202 **1 Claim**



Axial adjustment means for a tool, particularly for controlling the depth of a cutting tool having a cylindrical bore for rotatable mounting on a pilot, comprising an outwardly threaded surface on the tool adjacent one end thereof, the end portion of the tool bore being outwardly annularly tapered, a cylindrical sleeve slidably received in the bore, a compressible ferrule surrounding said sleeve and having one end portion nested in the tapered end portion of the bore, an internally threaded collar having an inwardly tapered end portion, the collar being screwed on the outwardly threaded end portion of the tool around the ferrule to releasably compress the ferrule in frictional locking engagement with the sleeve and a bolt threadably passing through the sleeve

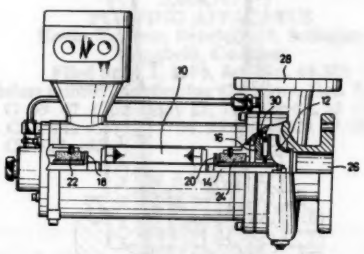
with its inner end engageable with the end of the pilot whereby initial approximate adjustments are made rapidly by sliding the tool axially of the sleeve and locking the sleeve by means of the collar and fine adjustments are made thereafter by rotation of the adjusting bolt.

3,664,757
STALL CONTROL FOR VANE AXIAL COMPRESSORS
Robert E. Salisbury, Whittier, and John W. Erickson, Huntington Beach, Calif., assignors to Preco, Inc., Los Angeles, Calif.
Original application July 18, 1969, Ser. No. 842,983, now Patent No. 3,597,111, dated Aug. 3, 1971. Divided and this application Apr. 7, 1971, Ser. No. 132,149
Int. Cl. F04d 5/00
U.S. Cl. 415—53 3 Claims



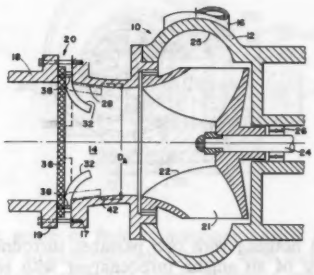
Improved stability with respect to aerodynamic stalling in an axial flow gas compressor is obtained by aperturing one or more blades, the apertured blades typically forming a plurality of blade groups alternating with groups of unapertured blades.

3,664,758
AXIAL THRUST BALANCING MECHANISM FOR MOTOR DRIVEN PUMP
Ryuichi Sato, Tokyo, Japan, assignor to Nikkiso Co., Ltd., Tokyo, Japan
Filed Dec. 15, 1970, Ser. No. 98,281
Claims priority, application Japan, Aug. 6, 1970, 45/68,527
Int. Cl. F04d 29/66, 13/02
U.S. Cl. 415—104 8 Claims



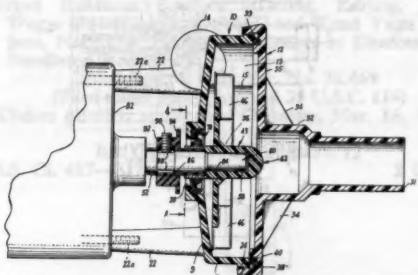
An axial thrust balancing mechanism for motor pump wherein two thrust bearings of the material which permit a certain degree of abrasion are symmetrically arranged and secured to an interior of a pump casing so as to encompass each end of motor rotor shaft through two symmetrically arranged thrust washers mounted on the motor rotor shaft between the motor rotor and the thrust bearing with a certain clearance. An auxiliary thrust bearing of the material which permits a certain degree of abrasion is releasably fixed to one side wall of the end plate forming a variable orifice provided before and/or behind the impeller.

3,664,759
SELF-ADJUSTING BACKFLOW PREVENTOR FOR CENTRIFUGAL PUMPS
Hans J. Biheller, Riveredge, N.J., assignor to Worthington Corporation, Harrison, N.J.
Filed Sept. 16, 1970, Ser. No. 72,650
Int. Cl. F04d 1/00, 15/00, 29/00
U.S. Cl. 415—121 5 Claims



A pump is disclosed which includes a casing having an inlet, an outlet and a pumping chamber disposed therebetween. An impeller is rotatably disposed in said pumping chamber, and self-adjusting backflow prevention means is disposed adjacent said inlet for automatically varying the effective diameter of said inlet in response to variations in backflow.

3,664,760
CENTRIFUGAL PUMP
Norbert L. Reiner, Wallingford, Conn., assignor to Coleco Industries, Inc., Hartford, Conn.
Filed Sept. 2, 1970, Ser. No. 68,911
Int. Cl. F04d 1/00, 29/02, 13/02
U.S. Cl. 415—170 A 4 Claims



A centifugal pump has a synthetic plastic impeller with an elongated portion cooperatively dimensioned and configurated to engage and cover the shaft of a motor driving the pump and which physically and electrically isolates the fluid being pumped from the motor. The housing of the pump has a pump chamber with an aperture therein through which the hub extends. Sealing means is provided about the aperture, which includes a radial lip seal and cylindrical metallic sleeve with an interior elastomeric coating press fit onto the hub to insure positive engage-

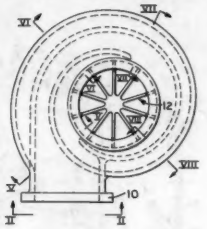
ment therebetween despite varying temperatures and the inherent difference in thermal coefficients of expansion of the two materials. A radially extending disc-shaped slinger is fixed on the elongated hub outboard of the impeller and the radial seal.

3,664,761

TURBINE HOUSING WITH TWO INLET PASSAGES

Virgil A. Zastrow, Edelstein, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 19, 1969, Ser. No. 886,564
Int. Cl. F01d 1/00; F01k 23/14
U.S. Cl. 415—205 6 Claims



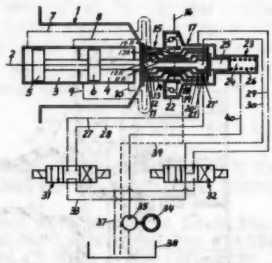
A turbine housing with two passages surrounding the turbine rotor of an engine turbocharger with each passage disposed to receive exhaust gases from two different groups of engine cylinders. Each passage is a volute which discharges gas throughout substantially 360° of the rotor circumference and the passages are indexed to cause their discharge openings to be out of phase with each other to reduce imbalance and vibration of the rotor.

3,664,762

APPARATUS FOR SUPPLYING PRESSURIZED FLUID TO A ROTATING DEVICE

Friedrich Lachnit, Hamburg, Germany, assignor to Deutsche Babcock & Wilcox Aktiengesellschaft, Oberhausen, Germany

Filed July 20, 1970, Ser. No. 56,376
Claims priority, application Germany, July 30, 1969, P 19 38 596.7
Int. Cl. F01d 25/00; F04d 27/00
U.S. Cl. 416—156 6 Claims



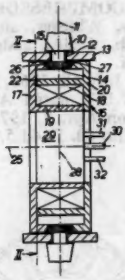
An apparatus for supplying pressurized control fluid from a non-rotating member to a rotating device is described. The rotating device is provided with axially concentrically arranged fluid carrying channels separated by annular walls which terminate at an axial end of the device. The non-rotating member is provided with axially concentric channels separated by annular walls which terminate at an axial end in abutment with the walls in the rotating device. An axial pressurized device is employed to maintain the non-rotating and rotating walls in axial abutment to form high quality seals capable of carrying fluid pressures measured in hundreds of atmospheres.

3,664,763

VARIABLE-PITCH BLADED ROTORS

John Alfred Chilman, Painswick, England, assignor to Dowty Rotol Limited, Gloucester, England

Filed Nov. 3, 1969, Ser. No. 873,464
Claims priority, application Great Britain, Nov. 15, 1968, 54,283/68
Int. Cl. B64c 11/38
U.S. Cl. 416—157 1 Claim



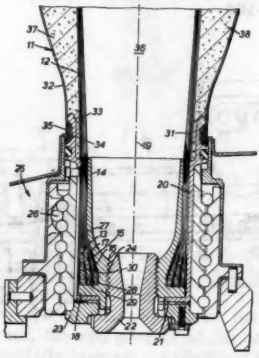
Pitch-change mechanism for the blades of a variable-pitch bladed rotor comprise a fluid-operated vane-type actuator for mounting coaxially of the rotor and for rotation therewith. The actuator has a multiplicity of chambers formed by a first multi-vaned actuator part and a second multi-vaned actuator part. The two actuator parts are angularly movable in opposite directions about the rotation axis to drive the blades at substantially diametrically opposed points of the blades to vary their pitch angle.

3,664,764

DEVICES OF FIBROUS-REINFORCED PLASTICS MATERIAL

Stuart Duncan Davies, Roy Fred John McCarthy, and Richard James Watts, Cheltenham, England, assignors to Dowty Rotol Limited, Gloucester, England

Filed June 25, 1970, Ser. No. 49,742
Claims priority, application Great Britain, July 18, 1969, 36,422/69
Int. Cl. F01d 5/30
U.S. Cl. 416—224 8 Claims



A device, for example a blade for an aircraft propeller, has an end portion and a portion adjacent thereto both of fibrous-reinforced plastics material. The end portion is enlarged by wedge members which intervene between groups of fibers of the material and which are so shaped that the fibres pass smoothly along curved paths from the end portion to the said portion adjacent thereto.

3,664,765
NiCrCo ALLOYS TURBINE BLADE WITH CHROMIUM DIFFUSION LAYER

Tsuyoshi Ishimatsu, Tokyo, Takashi Ito, Masamitsu Yano, and Hajime Takeda, Chiba, and Kentaro Nagano, Yokohama, Japan, assignors to Asahi Glass Co., Ltd., Tokyo, Japan

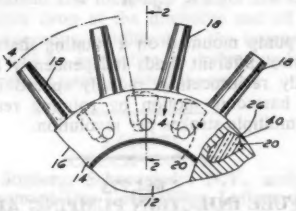
No Drawing. Continuation of application Ser. No. 634,900, May 1, 1967. This application Mar. 9, 1970, Ser. No. 17,014
Claims priority, application Japan, May 4, 1966, 41/28,059; Feb. 24, 1967, 42/11,406
Int. Cl. F01d *5/14*
U.S. Cl. 416—241 1 Claim

An alloy comprised mainly of chromium, nickel and cobalt and excellent in corrosion- and heat resistance, particularly, an alloy having the high corrosion resistance to a high temperature combustion gas containing sulfur oxides and alkali compounds and suitable for a blade for a gas turbine. The said alloy is provided with a chromium diffusion layer on its surface by a chromizing treatment.

3,664,766
TURBINE WHEEL

Christian J. Rahnke, Roseville, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed June 1, 1970, Ser. No. 42,361
Int. Cl. F01d *5/02*
U.S. Cl. 416—244 13 Claims

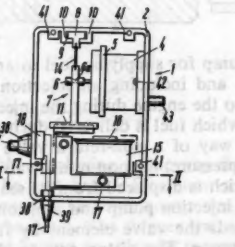


A rotor wheel for a gas turbine engine including a disc body having an axially enlarged rim defining the periphery of the body. A plurality of circumferentially spaced blades are carried by the rim and extend radially therefrom. A plurality of circumferentially spaced cores constructed of a light weight high melting point material, for example, ceramic, are positioned in this rim and each of these cores is located circumferentially between a pair of adjacent blades.

3,664,767
PUMPING APPARATUS

Erwin Kolfertz, Bebelallee 9, Solingen-Merscheid, Germany

Filed Sept. 3, 1970, Ser. No. 69,388
Claims priority, application Germany, Dec. 5, 1969, G 69 47 175.6; May 12, 1970, P 20 23 516.9
Int. Cl. F04b *49/06, 35/04, 17/04;* H02k *33/00, 35/00*
U.S. Cl. 417—45 7 Claims

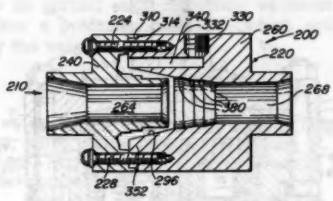


Pumping apparatus incorporating a diaphragm pump driven by an A.C. oscillating armature motor. The electromagnetic coil of the motor is mounted on a plate which is slideable to allow adjustment of the air gap between the coil and the armature to provide adjustment in the pumping rate.

3,664,768
FLUID TRANSFORMER

William T. Mays, Indian River County (283 6th Ave. SW., Vero Beach, Fla. 32960), and John C. Mays, Citrus County, Fla. (Box 476, Homosassa Springs, Fla. 32646)

Filed Mar. 10, 1970, Ser. No. 18,212
Int. Cl. F04f *5/46*
U.S. Cl. 417—197 12 Claims

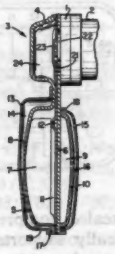


A jet pump or fluid transformer having a housing of generally straight-through tubular form and including a suction end portion and a fluid discharge end portion, and fluid jet input means communicating with the interior of the housing at a position intermediate opposed ends thereof to deliver and to discharge impelling fluid under pressure into the housing, the housing being characterized in that it carries on an inside wall thereof downstream of said fluid jet input means a plurality of radially inwardly displaced annular bands, rings, flanges, or facets spaced lineally along the housing, the rings as viewed in cross section extending in planes generally normal to a longitudinal axis of the housing and defining fluid flow abutment or entrainment elements effective to orient flow patterns and physical distribution of fluid molecules impinging thereagainst, thereby to enhance the fluid wall boundary flow rate and to provide impoved overall pumping efficiency.

3,664,769
HERMETICALLY ENCLOSED SMALL REFRIGERATING MACHINE

Jorgen Dahlman Knudsen, Gjesing, Esbjerg, Bendt Wegge Romer, Augustenborg, and Knud Vagn Valbjorn, Nordborg, Denmark, assignors to Danfoss A/S, Nordborg, Denmark

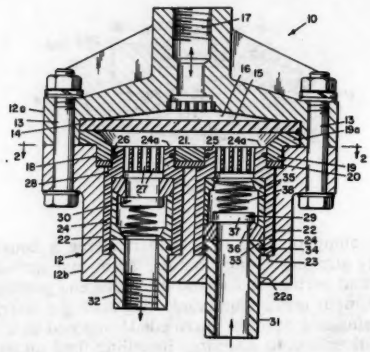
Filed Aug. 4, 1969, Ser. No. 32,469
(Filed under Rule 47(a) and 35 U.S.C. 116)
Claims priority, application Germany, Mar. 16, 1968, P 16 01 860.3
Int. Cl. F01n *7/14;* F04b *39/12*
U.S. Cl. 417—312 2 Claims



The invention relates to a noise reducing assembly for a refrigeration unit of the hermetically sealed type. The

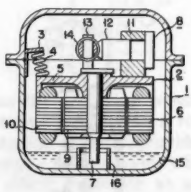
assembly includes walls forming a heat insulation chamber surrounding the noise reducing chamber with a substantially statically contained gas in said heat insulation chamber.

3,664,770
DIAPHRAGM PUMPS
Harry E. Palmer, Calgary, Alberta, Canada, assignor to Golden Arrow Manufacturing Limited, Calgary, Alberta, Canada
Filed Feb. 18, 1970, Ser. No. 12,237
Int. Cl. F04b *17/00, 43/06*
U.S. Cl. 417—383 **2 Claims**



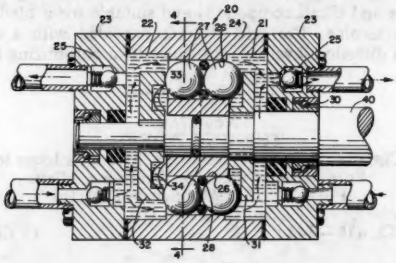
A metallic housing contains a diaphragm and a backing plate of plastic material, the plate having an annular flange in abutment with the diaphragm so as to form a pumping chamber. Inlet and outlet valves are contained in plastic sleeves in the housing, the sleeves communicating with the pumping chamber and being sealingly fitted in openings in the backing plate. Thus, abrasive or corrosive liquid pumped through the valves and chamber is prevented by the plastic components from contacting the metallic housing.

3,664,771
HERMETICALLY SEALED ELECTRIC COMPRESSOR
Akira Suzuki, Sagamihara, and Keisuke Ida, Fuji, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan
Filed Feb. 3, 1971, Ser. No. 113,037
Claims priority, application Japan, Feb. 20, 1970, 45/16,239
Int. Cl. F04b *17/00, 35/04*
U.S. Cl. 417—410 **4 Claims**



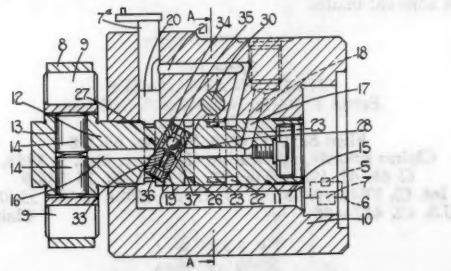
A hermetically sealed compressor comprising a compressor body elastically supported in a sealing case and a protector so disposed as to enclose the lower end of the revolving shaft of an electric motor constituting an element of said body and provided with at least one repulsing means wherein, when the revolving shaft rotates along the inner wall of the protector upon the heavy shaking of the compressor body, and the lower end of the shaft is forced back to the original position of the protector by the repulsing means, thereby preventing said rotation from being carried to excess.

3,664,772
FLUID PUMP
Viktor Mitrushi Panariti, 111 Imperial Heights Drive, Ormond Beach, Fla. 32074
Filed Sept. 4, 1970, Ser. No. 69,590
Int. Cl. F04b *1/12, 19/00, 23/04*
U.S. Cl. 417—486 **3 Claims**



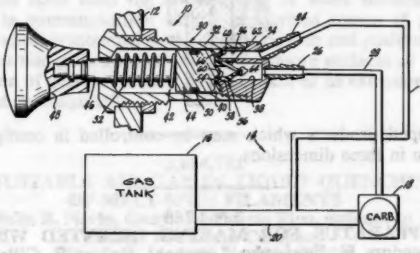
A fluid pump mounted on a rotating shaft capable of pumping two different fluids independently having multiple axially reciprocating, radially spaced ball pistons, driven in harmonic motion by rotating reaction cams providing multiple strokes per revolution.

3,664,773
LIQUID FUEL INJECTION PUMPING APPARATUS
Moshe Drori, East Twickenham, England, assignor to C.A.V. Limited, Birmingham, England
Filed Sept. 4, 1970, Ser. No. 69,615
Claims priority, application Great Britain, Oct. 1, 1969, 48,152/69
Int. Cl. F04b *7/02, 39/08*
U.S. Cl. 417—507 **5 Claims**



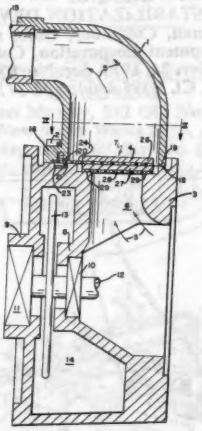
A fuel pump for supplying fuel to an internal combustion engine and including an injection pump, which delivers fuel to the engine during the injection strokes thereof, and to which fuel is delivered during the filling strokes thereof by way of a non-return valve from a source of fuel under pressure, the non-return valve including a valve element which is displaced from its seat to permit fuel to flow to the injection pump and a piston member which is urged towards the valve element by fuel under pressure from the source. The piston acts to close the valve element quickly as the flow of fuel towards the injection pump ceases.

3,664,774
PRIMER PUMP
Willis E. Tupper and John R. Hanson, Dexter, Mich., assignors to Dexter Automatic Products Co., Inc., Dexter, Mich.
Filed May 5, 1970, Ser. No. 34,691
Int. Cl. F04b 21/02, 39/10
U.S. Cl. 417—560 4 Claims



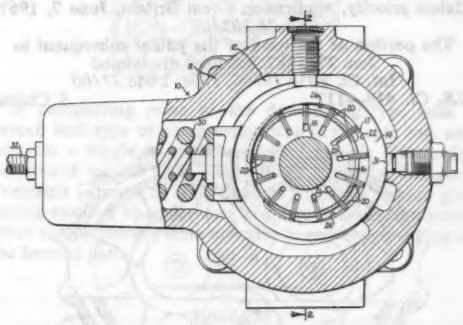
A fuel primer pump especially adapted for use in connection with internal combustion engines for vehicles such as snowmobiles and the like. The primer pump includes a unitary resilient check valve element for restricting the fuel through the pump to one direction of flow only, and the valve element and the pump plunger are arranged so that a pressure drop at the discharge end of the pump induced by operating conditions of the internal combustion engine will be ineffective to induce undesired flow of fuel through the pump to flood the engine.

3,664,775
CHECK VALVE
Carl E. Stigberg, Schenectady, N.Y., assignor to Environment/One Corporation, Latham, N.Y.
Continuation-in-part of application Ser. No. 867,793, Oct. 20, 1969. This application Jan. 5, 1970, Ser. No. 573
Int. Cl. F04b 21/02; F16k 15/00
U.S. Cl. 417—566 15 Claims



A pump assembly employing a one-way flapper valve directly between the cast head of a pump and the cast flow directing elbow for external connection, which elbow is bolted to the head. The flapper valve employs a polypropylene sheet having an enlarged mounting portion secured in a recess to the elbow and clamped between the elbow recess and the head where the elbow is bolted to the head. A reduced thickness hinge portion allows universal movement of the valve sealing portion of the sheet with respect to the mounting portion, which sealing portion has brass weights laminated to its opposite sides and a rubber sheet laminated to the other side of one of the brass weights for engaging a valve seat machined around the periphery of the head discharge port. Particularly for corrosive heads a sealing resilient ring is bonded in an annular groove in the head around the head discharge port for sealing engagement with the adjacent flapper brass weight, which structure replaces the rubber sheet. Mating machined surfaces on the head and elbow, as well as a chordal portion of the otherwise circular elbow provide a secure clamping of the polypropylene sheet so that its hinged portion will always return the valve to its normal sealing position whenever pressure falls below a predetermined level, which action is assisted by the weights.

3,664,776
VARIABLE VOLUME VANE PUMP
Albert D. Mills, Minneapolis, and Walter F. Ruhland, Shakopee, Minn., assignors to Continental Machines, Inc., Savage, Minn.
Filed Aug. 17, 1970, Ser. No. 64,196
Int. Cl. F01c 19/08, 21/16; F04c 15/00
U.S. Cl. 418—16 8 Claims

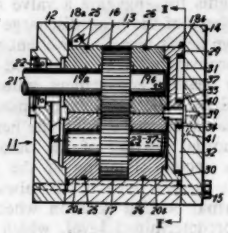


In a sliding vane pump having end plates a rotor with its vanes and a movable cam ring which eccentrically surrounds the rotor during pumping. One of the end plates is hydraulically urged toward the other by fluid at pump outlet pressure exerted on its outer side at a zone thereof axially opposite the pump outlet zone. The area on which such fluid exerts inward force is crescent shaped, defined by two seal rings, one encircling the rotor shaft, the other larger and encircling the smaller one.

3,664,777
HIGH PRESSURE GEAR PUMP
Yasuo Aoki, Yokohama-shi, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho (Komatsu Ltd.), Tokyo, Japan
Filed Dec. 19, 1969, Ser. No. 886,647
Claims priority, application Japan, Dec. 26, 1968, 43/113,798
Int. Cl. F01c 19/08; F03c 3/00; F04c 27/00
U.S. Cl. 418—131 7 Claims

A high pressure gear pump provided with a back pressure loading mechanism characterized in that the back pressure is eccentrically subjected to a pair of bushes facing a driving gear and a driven gear, respectively. A pair of axially movable pressures plates are inserted

between the bushes and the inner wall of the casing and formed with a pair of high pressure chambers arranged eccentrically towards the high pressure side.



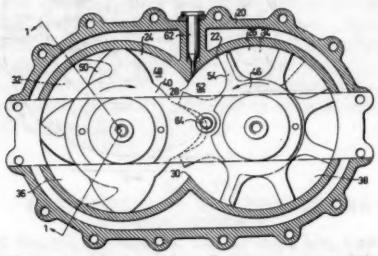
A high pressure fluid is admitted into the pair of high pressure chambers, whereby the pump is prevented from seizure.

3,664,778

ROTARY INTERNAL COMBUSTION ENGINE AND SEALING MEANS THEREFOR

Hans Robert Nilsson, Ektorp, Sweden, assignor to Svenska Rotor Maskiner Aktiebolag, Nacka, Sweden

Original application June 5, 1968, Ser. No. 734,587, now Patent No. 3,491,730, dated Jan. 27, 1970. Divided and this application Nov. 12, 1969, Ser. No. 875,863
Claims priority, application Great Britain, June 7, 1967, 26,302/67
The portion of the term of the patent subsequent to Jan. 27, 1987, has been disclaimed
Int. Cl. F01c *19/00, 1/08;* F04c *27/00*
U.S. Cl. 418—117 5 Claims



Rotary internal combustion engine comprising two intermeshing grooved rotors mounted in a stationary housing, providing continuously sealed inlet sluice chambers, operation chambers, for compression, combustion and expansion, and outlet sluice chambers, having a set of sealing elements for positive sealing of each chamber.

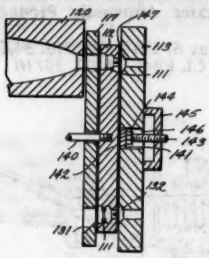
3,664,779

APPARATUS FOR PRODUCING SHAPES WITH CONTROLLED THREE DIMENSIONS

Robert W. La Warre, Lima, Ohio, assignor to Beatrice Foods Co., Chicago, Ill.

Filed Apr. 1, 1969, Ser. No. 812,093
Int. Cl. B29d *27/00*
U.S. Cl. 425—4 7 Claims

There is provided a process for producing expanded shaped products by feeding an expandable mass at elevated temperatures and pressures into a die having minor openings in the die opposite the major openings of the die, the latter of which being adjacent a feeding device such as an extruder. After stabilization of the expanded mass in the die, the shaped product is discharged from the die by exit through the major opening, the major opening having been moved away from the feeding device. The method and die of the invention are capable of producing



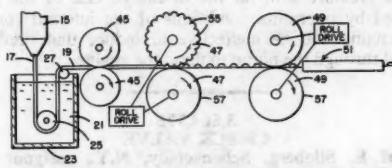
shaped products which may be controlled in configuration in three dimensions.

3,664,780

APPARATUS FOR MAKING ORIENTED WEBS

Theodore H. Fairbanks, Liverpool, Robert F. Gillespie, Havertown, and Dorsey C. Nelson, Springfield, Pa., assignors to FMC Corporation, Philadelphia, Pa.

Original application Dec. 17, 1968, Ser. No. 784,382, now Patent No. 3,574,809. Divided and this application Aug. 5, 1970, Ser. No. 61,187
Int. Cl. B29d *7/00*
U.S. Cl. 425—66 4 Claims



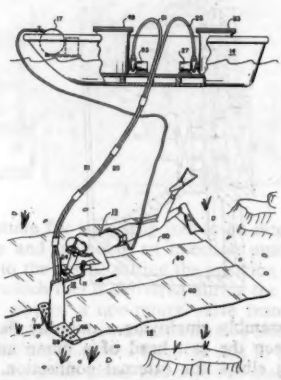
Apparatus for making an unbroken polymeric web or film having projecting unoriented sections surrounded by a predetermined pattern of uniaxially and biaxially oriented regions.

3,664,781

SILT STABILIZATION DEVICE

Michael U. Widman, Columbus, Ohio, assignor to The Battelle Development Corporation, Columbus, Ohio

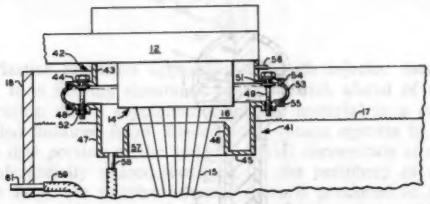
Filed Nov. 24, 1969, Ser. No. 879,339
Int. Cl. B29f *3/04;* E02 *3/12*
U.S. Cl. 425—68 10 Claims



The silt on the bottom of a body of water is stabilized by extruding a ribbon of a gelable material onto the silt covered bottom and simultaneously extruding one or

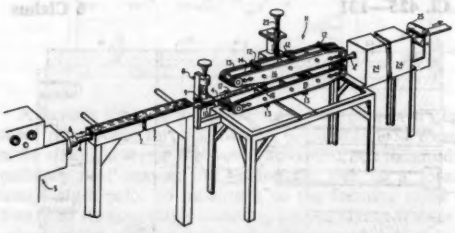
more ribbons or streams of a gelling agent onto one or both surfaces of the ribbon of gelable material before the gelable material has dispersed or dissolved, thus providing a gelled flexible and conforming ribbon or blanket covering the bottom. A preferred apparatus for co-depositing such ribbons consists of a depending arm provided with an elongated or slit-shaped jet which is in communication with a pressurized source of a gelable material and which is positioned to extrude the gelable material in ribbon form onto the bottom. One or more slit-shaped jets in communication with a pressurized source of gelling agent is mounted to the depending arm and positioned to extrude gelling agent onto one or more surfaces of the ribbon of gelable material at the instant of its extrusion to effect its coagulation.

3,664,782
ADJUSTABLE AIR GAP IN LIQUID QUENCHING OF MELT-SPUN FILAMENTS
John B. Nevin, Guayama, Puerto Rico, assignor to Phillips Petroleum Company
Filed Dec. 16, 1970, Ser. No. 98,626
Int. Cl. D01d *3/00*
U.S. Cl. 425—71 **10 Claims**



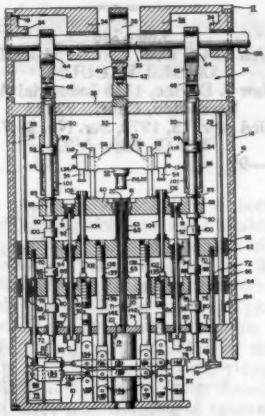
In a system for liquid quenching melt-spun filaments in a quench tank below the spinneret, a weir device is adjustably attached directly to the spin block so that the vertical distance between the spinning face and the upper surface of the quenching liquid is determined by the adjustment of the mounting means for the weir device, regardless of minor variations in the vertical spacing between the spinneret and the quench tank.

3,664,783
APPARATUS FOR THE PRODUCTION OF TUBING
Dudley Stuart Murray, 592 Old Northern Road, Dural, New South Wales 2158, Australia
Filed Aug. 28, 1969, Ser. No. 853,662
Claims priority, application Australia, Aug. 30, 1968, 42,767/68
Int. Cl. B29d *23/04*
U.S. Cl. 425—71 **8 Claims**



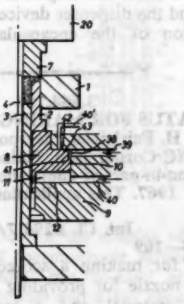
Apparatus for maintaining a difference in internal pressure levels between adjacent portions of the path of an advancing flexible tube. The apparatus includes a plurality of clamping means which successively engage with the tube and move with it as it passes from one portion of its path to the next. At least one of the clamping means is in engagement with the tube at any instant. The clamping means may comprise opposed pressure pads on endless conveyors moving alongside the tube.

3,664,784
COMPACTING PRESS
Joseph F. Sibley, Philadelphia, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.
Filed Jan. 19, 1970, Ser. No. 3,884
Int. Cl. B30b *11/02*
U.S. Cl. 425—78 **10 Claims**



A compacting press of the downacting type with a breech lock type of compression stop in the core rod, and wherein a toggle is employed to release die platens for downward motion after compression of the formed part. Provision is made to strip the dies from the formed part during ejection by applying a positive, downwardly acting force against the die table and also to prevent restriking of the formed part.

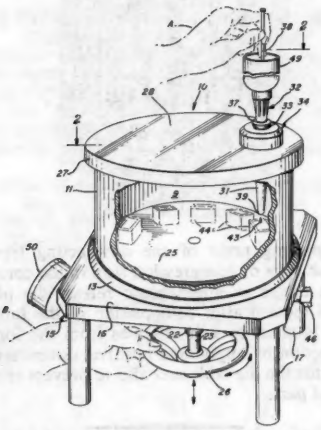
3,664,785
PRESSES FOR PRODUCTION OF COMPLEX COMPONENTS
Alec Frank Marshall, Solihull, and Hugh Gordon Taylor, Birmingham, England, assignors to The Birmingham Small Arms Company Limited, Birmingham, England
Filed Dec. 9, 1969, Ser. No. 883,032
Claims priority, application Great Britain, Dec. 13, 1968, 59,300/68
Int. Cl. B29c *3/00*
U.S. Cl. 425—78 **12 Claims**



A tool for a high energy rate machine for the production of compacts of metal powders of two or more sections of different thickness in line of pressure comprises

an upper punch fixed to a reciprocal machine ram, a die having a bore defining the periphery of the compact to be produced, a fixed lower punch and a movable flange punch disposed within the bore and forming together a lower closure for the bore, a flange punch piston fixed to the flange punch having upwardly and downwardly facing surfaces, means for supplying fluid pressure to the downwardly facing surface to hold the flange punch in an upper position prior to compaction of powder contained within the die, and means for supplying fluid pressure to the upwardly facing surface to move the flange punch piston downwardly during compaction of the powder by the upper punch.

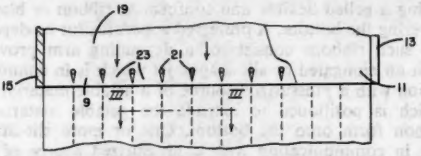
3,664,786
APPARATUS FOR ENCAPSULATION UNDER VACUUM
Arthur J. Devine, 1310 Industrial Ave., Escondido, Calif. 92025
Filed Apr. 15, 1970, Ser. No. 28,718
Int. Cl. B29c *3/02*
U.S. Cl. 425—99 **12 Claims**



A vacuum chamber is formed by means of a side wall portion and base and cover portions which are fitted to the side wall portion in vacuum tight relationship. The cover portion is transparent to permit viewing of the contents of the chamber and has an access opening in which a dispenser device is supported. A turntable is supported in the base portion, this turntable being manually rotatable from outside of the chamber. With articles to be encapsulated or impregnated placed in the chamber on the turntable, the chamber is evacuated and encapsulating material dispensed thereon from the dispenser device. The turntable is rotatable and the dispenser device manipulable to facilitate application of the encapsulating material to the articles.

3,664,787
APPARATUS FOR MAKING SCORED FILM
Theodore H. Fairbanks, Liverpool, Pa., assignor to FMC Corporation, Philadelphia, Pa.
Continuation-in-part of application Ser. No. 689,478, Dec. 11, 1967. This application Jan. 6, 1970, Ser. No. 889
Int. Cl. B29d *7/00*
U.S. Cl. 425—109 **5 Claims**

Apparatus for making a scored film which includes an extrusion nozzle for providing a streamlined flow of film-forming material and a series of spaced flow-obstructing members, which are of uniform cross-section throughout their lengths, positioned within the nozzle and inwardly of the orifice thereof for dividing the streamlined flow of film-forming material into a plurality of substreams. The locations of the flow-obstructing members relative to the nozzle extrusion orifice is such that the

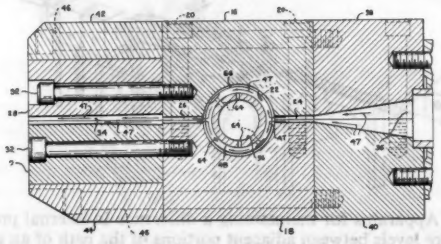


substreams of film-forming material contact and are only partially blended with each other as the film-forming material issues from the nozzle orifice.

3,664,788
DEVICE FOR DEPOSITING DOTS OF MOLDING COMPOUND
Allen A. Greenberg, Springfield Township, Hamilton County, Ohio (9149 Peachblossom Court, Cincinnati, Ohio 45231)
Filed Nov. 23, 1970, Ser. No. 91,841
Int. Cl. B29f *1/00*
U.S. Cl. 425—109 **7 Claims**

A device for depositing dots of molding compound on an absorbent sheet. A tubular die member slides inside a guide portion of a hollow body. A plunger telescopes in a main chamber of the die member. A leaf spring mounted in the body engages the head of the plunger. The spring exerts force on the plunger. The spring yields with an audible click when the body is urged with more than sufficient force to extrude molding compound.

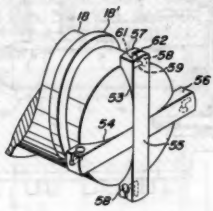
3,664,789
ROTARY EXTRUSION DIE
Lloyd W. Gibney, Funkstown, Md., assignor to American Optical Corporation, Southbridge, Mass.
Continuation of abandoned application Ser. No. 809,527, Mar. 24, 1969. This application May 12, 1971, Ser. No. 142,804
Int. Cl. B29f *3/12*
U.S. Cl. 425—131 **6 Claims**



A die for extruding variegated plastic sheet stock wherein an inlay of preselected color extends through the thickness of the extrusion in a continuously repetitive

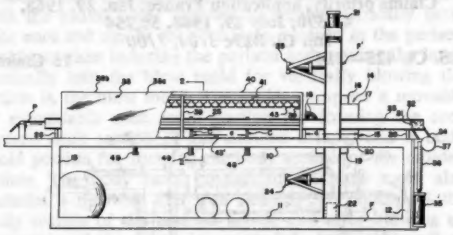
pattern of predetermined configuration with provision for altering the pattern without interruption of the flow of the extrusion. The die receives a main supply of heat-softened plastic of a pre-selected base color which is interspersed with a differently colored heat-softened plastic material directed laterally into the die cavity through a rotary distribution tube in controlled amounts and locations across the main supply.

3,664,790
PLASTIC EXTRUSION APPARATUS
Irvin Hollander, Dayton, Ohio, assignor to Tii Dee Products Co., Dayton, Ohio
Filed Dec. 5, 1969, Ser. No. 882,462
Int. Cl. B29f *3/02*
U.S. Cl. 425—131 **9 Claims**



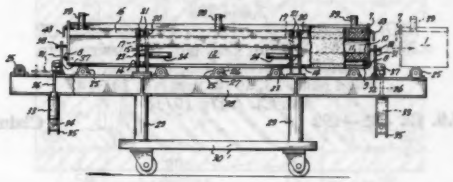
Plastics extrusion apparatus in which injector means add to a flowing stream of base material, ahead of the extrusion die, a supplemental plastic material in a controlled fluidized form. Bladed rotor means operate to direct that portion of the added material concentrate at circumferentially spaced locations on the periphery of the base flow. On relative advance there is produced in the base material a decorative surface streaking of the added material. The design thereof is dictated by the nature and rate of injection of added material and the rotor control of the base flow.

3,664,791
APPARATUS FOR CONTROLLING THE SAGGING OF A THERMOPLASTIC SYNTHETIC PLASTIC WEB BEING FED THROUGH A THERMOFORMING MACHINE
Gaylord W. Brown, Beaverton, Mich., assignor to Koehring Company, Milwaukee, Wis.
Filed Jan. 5, 1970, Ser. No. 699
Int. Cl. B29c *17/00*
U.S. Cl. 425—156 **7 Claims**



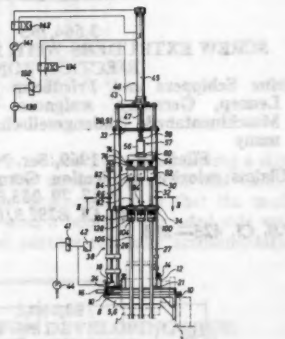
A system for preventing the undue sagging of a plastic sheet proceeding through heating apparatus to a forming mold station wherein the web is advanced in a longitudinal pathway past heaters for raising the web to a forming temperature prior to moving it to the forming mold station, and transversely extending, cooled clamp frames for gripping the web at longitudinally spaced intervals are provided and function to inhibit the sagging of the web which would otherwise occur by gripping the web and maintaining comparatively rigid longitudinally spaced apart strips in the web upstream of the mold station, during the time the mold mechanism is closed, to form articles in the plastic web.

3,664,792
CONCRETE PLANK MOLDING MACHINE
Roland C. Draughon, 2922 S. Adams 98401; Paul D. Jensen, 1011 68th Ave. E. 98424; and Donald F. Jensen, 1005 Fife Heights Drive NE. 98422, all of Tacoma, Wash.
Filed May 7, 1969, Ser. No. 822,506
Int. Cl. B28b *7/02*
U.S. Cl. 425—186 **9 Claims**



A concrete plank mold including a bottom with a flexible groove-forming strip and sides tiltable relative to the bottom can be moved into and out of a molding machine on rollers. Plates swingable by fluid-pressure jacks at opposite sides of the mold are securable by latch jacks to the mold sides. Tapered mold end plates are held against the ends of the mold sides to confine the material in the mold during swinging of the mold sides to settle the concrete mix. A concrete mix supply hopper overlying the mold has an adjustable-volume metering chamber for dispensing measured charges of concrete mix into the mold.

3,664,793
MANDREL FOR A DEVICE FOR THE PRODUCTION AND FILLING OF A CONTAINER OF THERMOPLASTIC SYNTHETIC MATERIAL
Gerhard Hansen, D7013 Oeffingen, Kreis Waiblingen, Hofener Strasse 47, Oeffingen, Germany
Filed Nov. 25, 1969, Ser. No. 879,720
Claims priority, application Germany, Dec. 6, 1968, P 18 13 047.7
Int. Cl. B29c *5/06; B65f 1/02*
U.S. Cl. 425—186 **19 Claims**



A mandrel for a device for the shaping of a container from a tube section of thermoplastic synthetic material is provided. The mandrel has co-axial pipes forming respectively a filling channel and a gas channel, and are mutually displaceable axially and have at their lower end a valve. The two pipes may be raised and lowered by means of raising and lowering devices independently from one another. A shaft, likewise operable by means

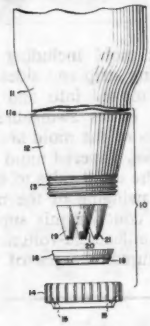
of a raising and lowering device and passing through the pipes, carries a valve member. The raising and lowering device for the outer one of the pipes engages on a displacement carriage carrying this pipe. These carriage raising and lowering devices, for the inner pipe and the shaft, are arranged in series. The length of the displacement carriage corresponds to the sum of the travel of the raising and lowering devices for the inner pipe and for the shaft. The displacement carriage is formed of two guide members and two cross-members displaceable on guide columns.

3,664,794

MULTIPLE LINE DECORATING DEVICE

Norman M. Wilton, Chicago, Ill., assignor to Wilton Enterprises, Inc., Chicago, Ill.

Filed Mar. 13, 1970, Ser. No. 19,314
Int. Cl. A47g *19/18*
U.S. Cl. 425—192 **7 Claims**



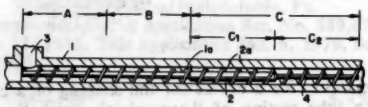
A decorating device for creating multiple borders with the application of a single pressure. The invention provides an insert containing a multiple number of circular openings in which pastry tubes of selected design are dropped. The loaded insert is locked into a coupling device, which, in turn, is attached to an icing container. This construction allows an operator to create any number of different multiple border designs using a single insert.

3,664,795

SCREW EXTRUDERS WITH DUAL SECTION EJECTION ZONE

Heinz Schippers and Friedhelm Hensen, Remscheid-Lennep, Germany, assignors to Barmag Barmer Maschinenfabrik Aktiengesellschaft, Wuppertal, Germany

Filed July 1, 1969, Ser. No. 838,077
Claims priority, application Germany, July 2, 1968, P 17 79 055.5
Int. Cl. B29f *3/02*
U.S. Cl. 425—208 **7 Claims**



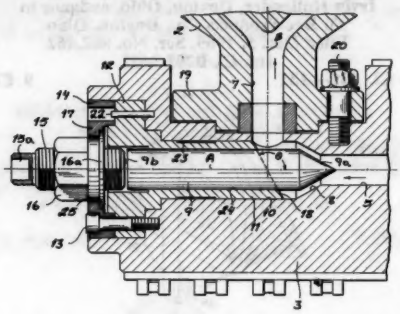
Screw extruders for extrusion of high viscosity thermoplastic melts embodying a dual section ejection zone wherein the downstream section has up to eight times the length of the upstream section and also a greater thread depth of the screw portion therein.

3,664,796

MANIFOLD ARRANGEMENT FOR AN EXTRUSION ASSEMBLY

Fritz Reifenhauser, Troisdorf, and Josef Klein, Siegtar, Germany, assignors to Reifenhauser KG, Troisdorf, Germany

Filed Aug. 11, 1969, Ser. No. 848,868
Claims priority, application Germany, Aug. 8, 1968, G 67 51 903
Int. Cl. B29f *3/06*
U.S. Cl. 425—208 **3 Claims**



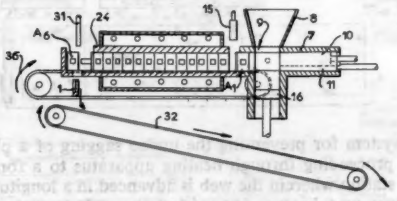
A manifold having a housing connects the plasticizing screw of an extrusion apparatus to several extrusion heads. The worm chamber opens into a primary passage in the housing from which a plurality of secondary passages lead at right angles to the separate molds. At each right-angle junction between primary and secondary passages there is provided a valve in the form of a needle-valve rod cooperating with a valve seat formed at the junction and in line with the primary passage. This valve member is actuatable from outside the housing by screw action to move it toward the seat and adjust or terminate the flow in the secondary passage.

3,664,797

APPARATUS FOR MOLDING ARTICLES FROM A PASTE-LIKE MATERIAL

Pierre Sorbier, Rue de Brancas, Pernes-les-Fontaines, France

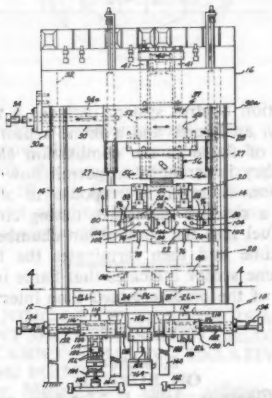
Filed Jan. 28, 1969, Ser. No. 794,631
Claims priority, application France, Jan. 29, 1968, 49,590; July 29, 1968, 50,254
Int. Cl. B29c *3/04, 7/00*
U.S. Cl. 425—214 **15 Claims**



A moulding tunnel having a composite piston movable therein is closed at one end by means of a separable mould inset. The moulding material is supplied into the tunnel between the composite piston and the mould inset by a suitable hopper and a plurality of transversely operable pistons are movable into the tunnel from the sides

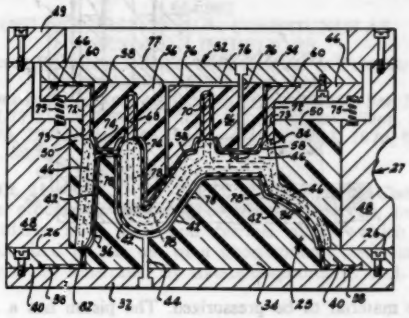
and bottom thereof. Upon a two-stage movement of the composite piston and the transversely movable pistons the mouldable material is forced into the mould insert to form an article. The mould insert and the article are then ejected from the mould tunnel and conveyed through a curing tunnel in contiguous relationship to a plurality of other mould inserts having moulded articles therein. At the end of the curing tunnel, the mould inserts are separated and the moulded article ejected. The mould inserts are then conveyed back to the tunnel for insertion into the end of the tunnel for a new moulding operation.

3,664,798
PARISON-TYPE BOTTLE BLOWING MACHINE
Ernest P. Moslo, 12700 Lake Ave., Lakewood, Ohio 44107
Filed Feb. 26, 1970, Ser. No. 14,310
Int. Cl. B29d *23/03*
U.S. Cl. 425—326 18 Claims



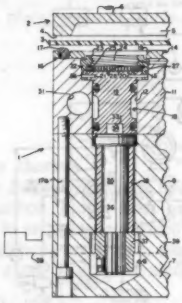
A compact blow-molding machine and a novel method for producing hollow articles of plastic or the like such as, for instance, plastic bottles having a configured or threaded neck section and a substantially smooth surfaced, generally vertically oriented body section. The machine comprises at least one generally laterally disposed blow mold, with the molds being adapted to receive vertically movable core rod means for forming a parison in the parison mold and then indexing the parison and moving the latter vertically into the blow mold for vertically blowing the article in the blow mold. The molds comprise a movable or expandable neck mold portion for forming the configured neck section of the molded article, and a body mold portion for forming the body section of the molded article. The body mold portion of the blow mold also includes a movable end wall defining the bottom of the body section of the molded article and after blowing or formation of the article is accomplished, the end wall of the body mold portion is moved out of interfering relation and the neck mold portion is opened or expanded, to permit ejection of the molded article vertically out of the blow mold. Chute means may be provided movable into coaction with the open-ended blow mold after movement of the end wall out of interfering relation, for directing the molded article to any desired location. Injection of the hot plastic material into the parison mold is accomplished vertically to form the aforementioned parison. The end result is a highly compact blow molding machine requiring a minimum of floor space.

3,664,799
POWDER COMPACTING PRESS
Claude Rollin Wallick, Jr., William Edward Blodgett, and Donald Keith Lazor, Louisville, Ky., assignors to American Standard Inc., New York, N.Y.
Filed Nov. 4, 1969, Ser. No. 873,890
Int. Cl. B28b *3/02*
U.S. Cl. 425—389 2 Claims



An isostatic powder press for compressing ceramic powders together to form a toilet bowl section, said press including one or more deformable membranes subjectable to fluid pressure to uniformly compress the powders to a substantially constant density throughout.

3,664,800
MOLDING OF THREADED CAPS
Frederick O. Miller, Saginaw, Mich., assignor to Miller Mold Company, Saginaw, Mich.
Filed June 25, 1969, Ser. No. 836,255
Int. Cl. B29c *17/04*; B29h *3/044*
U.S. Cl. 425—391 7 Claims

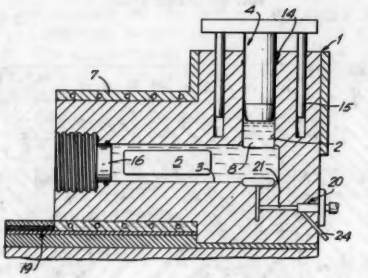


A mold for forming a molded plastic cap having a skirt provided with a helically threaded portion and axially ribbed gripping portion characterized in that the mold has a cavity provided with a helically threaded side wall and an axially grooved annulus rotatably accommodated in the cavity.

3,664,801
APPARATUS FOR DEVELOPING HIGH FLUID PRESSURE
Jean Martrier, Bourges, France, assignor to Etat Francais
Filed May 18, 1970, Ser. No. 38,348
Claims priority, application France, May 23, 1969, 6916845
Int. Cl. B30b *5/02, 11/32*
U.S. Cl. 425—405 9 Claims

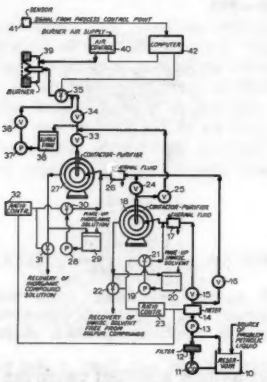
A pressure developing apparatus comprises a casing having first and second intercommunicating chambers extending at right angles to one another and filled with a

liquid. One chamber contains a slidable piston therein adapted for being externally acted on to pressurize the liquid in the chambers, and the other chamber contains



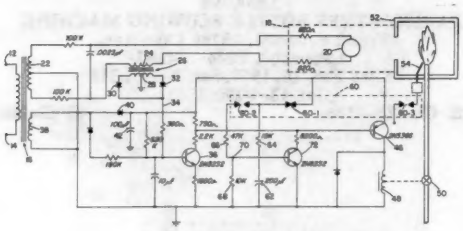
the material to be pressurized. The piston has a liquid inlet and a bore leading to the first chamber, and the inlet is closable by a valve which is subjected to the pressure of the liquid.

3,664,802
ON-SITE PURIFICATION OF PROBLEM PETROLIC LIQUID FUELS
Eric P. Garwood, 128 Naperville Road, Clarendon Hills, Ill. 60514
Filed Mar. 11, 1971, Ser. No. 123,146
Int. Cl. F23k 5/00
U.S. Cl. 431—3 **17 Claims**



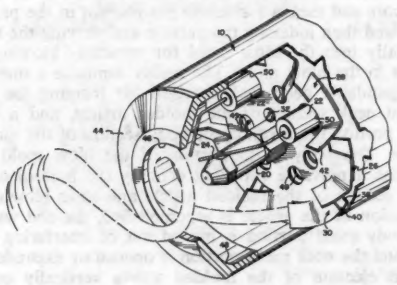
Sour crudes and residual oils, often high in deleterious ash content and of a type obtained relatively inexpensively from abroad, are usable for burning to generate heat, as for steam generation, while complying with updated air pollution regulations upon treating and purifying the crude or residual oil at or adjacent the site of the burner system at a rate substantially coincident with the rate of consumption by the burner system, usually with a surge tank in series to smooth out fluctuations in burner operation or to accommodate brief shutdowns of the treatment and purification equipment. The apparatus of the invention consists of the combination, with a burner system, of a reservoir for the crude or residual oil, means for conveying such petrolic liquid to respective contactor-purifiers for removing either sulfur compounds, or ash content, or both, and, with or without a surge tank, means for conveying the purified oil to the burner system. In a preferred embodiment the apparatus is automated in a completely integrated form.

3,664,803
COMBUSTION CONTROL SYSTEM
Phillip J. Cade, Winchester, Mass., assignor to Electronics Corporation of America, Cambridge, Mass.
Filed Aug. 3, 1970, Ser. No. 60,230
Int. Cl. F23n 5/20
U.S. Cl. 431—69 **8 Claims**



A combustion control system includes a fuel control, a flame relay, an igniter and a flame sensor for sensing the presence of flame in the combustion chamber. The control circuitry is arranged to permit flow of fuel into the combustion chamber in response to a request for ignition and a resistive capacitive timing circuit permits the flow of fuel into the combustion chamber for a predetermined time and then terminates the flow of fuel unless the flame sensor indicates that flame is present before the end of the predetermined time interval.

3,664,804
OIL BURNER
Norman E. Flournoy, John A. Morrison, and Julian H. Dancy, Richmond, and Raymond Trippet, Highland Springs, Va., assignors to Texaco Inc., New York, N.Y.
Filed Dec. 7, 1970, Ser. No. 95,672
Int. Cl. F23m 9/08
U.S. Cl. 431—183 **4 Claims**



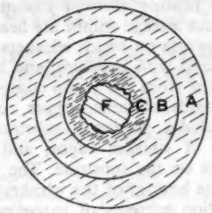
A gun type oil burner having a restriction plate in the barrel with adjustable orifices provided with struck-out radially extending deflecting vanes to effect a spiral spinning action of the air stream upstream of the burner tip, said burner tip involving a frustoconical collar to constrict and choke the spirally flowing air.

3,664,805

COMPOSITION FOR SCOURING NATURAL SILK AND TEXTILE FIBRES

Raymond Machon, Allee des Muriers, St.-Just-sur-Loire; Jean Flechet, Bd. de la Loire, Maison Jugo, St.-Just-sur-Loire; and Etienne Hugo, 21 Rue Gambetta, St.-Just-sur-Loire, all of Loire, France

Filed Jan. 15, 1970, Ser. No. 796
Claims priority, application France, Aug. 1, 1969, 6926402
Int. Cl. D01c *3/02*; D06l *1/14*
U.S. Cl. 8—138 4 Claims



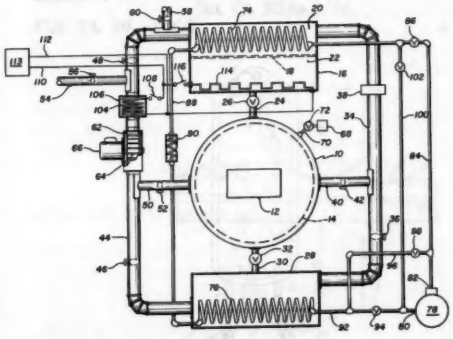
A composition for scouring textile fibres, chiefly natural silk, more particularly for simultaneously scouring and dyeing the silk, the components of the composition being mainly about 50 parts by weight of sodium oleate, about 35 parts of an alkaline product and about 15 parts of sodium hexametaphosphate.

3,664,806

DRY CLEANING OF TEXTILE FIBERS AND OTHER GARMENT MATERIALS WITH CHLOROFLUORO HYDROCARBONS HAVING RELATIVELY HIGH FREEZING POINTS

Irving Victor, Minneapolis, Minn., assignor to Research Development Co., Minneapolis, Minn.

Filed Sept. 13, 1963, Ser. No. 308,772
Int. Cl. D06l *1/02, 1/10*; C123g *5/02*
U.S. Cl. 8—142 11 Claims



Process and composition for cleaning textiles and other garment materials with a chloro-fluorohydrocarbon solvent having a relatively high freezing point which produces a high quality of cleaning without injury to the textiles, and in which the solvent can be recovered through condensation and solidification at easily attainable temperatures.

3,664,807

USE OF PHOSPHONIUM COMPOUNDS AS CORROSION INHIBITORS

Derek Redmore, Ballwin, Mo., assignor to Petrolite Corporation, Wilmington, Del.

No Drawing. Original application Sept. 26, 1966, Ser. No. 581,771, now Patent No. 3,531,514, dated Sept. 29, 1970. Divided and this application Apr. 22, 1970, Ser. No. 30,957
Int. Cl. C23f *11/04, 11/16*
U.S. Cl. 21—2.5 10 Claims

The process of inhibiting corrosion of metals, most particularly iron, steel and ferrous alloys, which is characterized by the use of a phosphonium compound.

These are illustrated by monophosphoniums such as

(1)

$$R_{3-1}\overset{\oplus}{P}(CH_2CH_2CN)_{1-3}\cdot X^{\ominus}$$

(2)

$$R_{3-1}\overset{\oplus}{P}CH_2CH_2\overset{O}{\overset{\|}{C}}OM_{1-3}\cdot X^{\ominus}$$

(3)

$$R_{3-1}\overset{\oplus}{P}(CH_2COOM)_{1-3}\cdot X^{\ominus}$$

(4)

$$R_3\overset{\oplus}{P}-A-\overset{\oplus}{P}R_3\cdot 2\overset{\ominus}{X}$$

(5)

$$R_3\overset{\oplus}{P}-B\overset{O}{\overset{\|}{C}}-O-A-O-\overset{O}{\overset{\|}{C}}B-PR_3\cdot 2X^{\ominus}$$

(6) Polymeric phosphoniums such as those containing the unit

$$\begin{array}{l} -AO- \\ \quad | \\ \quad CH_3 \\ \quad | \\ R_3\overset{\oplus}{P}\cdot X^{\ominus} \end{array}$$

and copolymers thereof.

In the above formulae R is a hydrocarbon or a substituted hydrocarbon group such as alkyl, aryl, cycloalkyl, etc., AO is an oxirane derived unit, A is alkylene, alkylene(O alkylene)$_n$-, xylylene, etc., B is alkylene and M is hydrogen, a salt moiety, an alcohol moiety, etc. and X is an anion.

3,664,808

PRODUCTION OF DICOBALTOUS OXYCHROMATE AND PERCOBALTOUS OXYCHROMATE

Kenneth E. Weber, Los Angeles, Geraldine H. Hoch, Chatsworth, and John L. Wanamaker, Burbank, Calif., assignors to Lockheed Aircraft Corporation, Burbank, Calif.

No Drawing. Filed Mar. 30, 1970, Ser. No. 24,024
Int. Cl. C01g *37/14*
U.S. Cl. 23—56 4 Claims

The disclosure pertains to the preparation of dicobaltous oxychromate and percobaltous oxychromates by the precipitation of these compounds from a reaction mixture containing chromic acid and cobaltous hydroxide in water. When the pH of such a mixture is maintained within the range of from about 4 to about 7, the dicobaltous oxychromate is produced; at a higher pH the percobaltous oxychromates are produced. These compounds are valuable as corrosion inhibitors.

3,664,809

RECOVERY OF ALUMINA FROM ALUMINOSILICATES

Maksymilian Burk, Los Angeles, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed May 4, 1970, Ser. No. 34,063
Int. Cl. C01f 7/04
U.S. Cl. 23—141 3 Claims

Alumina, H_2S and potash are recovered from aluminosilicates such as kaolin clay by reducing and then calcining a mixture of clay and polyhalite to yield a sinter of calcium and/or magnesium silicates and potassium aluminate and H_2S in the gas phase. The potassium aluminate is leached out of the sinter with potassium hydroxide and/or potassium carbonate solution and reacted with CO_2 to yield an aluminum hydroxide precipitate and a potassium carbonate solution.

3,664,810

PROCESS FOR OZONIZING UNSATURATED COMPOUNDS TO FORM ALKALI EARTH METAL PEROXIDE, ALIPHATIC ALDEHYDES AND ALIPHATIC KETONES

Anatoly Tikhonovich Menyailo, Scherbakovskaya 35, kv. 101; Mikhail Valerievich Pospelov, Komsomolsky prospekt 26, kv. 38; and Olga Romanovna Kaliko, Ulitsa Pivchenko 5, kv. 33, all of Moscow, U.S.S.R.; Inna Evgenievna Pokrovskaya, Moskovskaya obl., Vakzalnayaul. 7, kv. 37, Kaliningrad, U.S.S.R.; Valentine Vsevolodovna Fedorova, Ulitsa Rybalko 16, korp. 1, kv. 59; Albina Georgievna Shilnikova, Mytnaya ul. 23, korp 3, kv. 163; and Antonina Karpovna Yakovleva, Ul. Akademika Pavlova 56, kv. 81, all of Moscow, U.S.S.R.; and Tamara Georgievna Narozhenko, Moskovskaya obl., ul. Belinskogo 8, Kaliningrad, U.S.S.R.

No Drawing. Filed Sept. 3, 1968, Ser. No. 757,124
Int. Cl. C01b 15/04; C07c 47/00, 49/00
U.S. Cl. 23—187 7 Claims

Unsaturated hydrocarbons such as normal olefines, isoölefines, aralkylenes and cyclic olefines are converted to the corresponding carbonyl compounds, i.e., aldehydes or ketones, by reaction with ozone and an alkaline earth metal hydroxide in an aqueous or aqueous-organic medium, accompanied by the simultaneous formation of the alkaline earth peroxide.

3,664,811

PREPARATION OF ALUMINUM HYDRIDE BY HYDROGENATION OF ALUMINUM IN PRESENCE OF A DIALKYL ALUMINUM HYDRIDE

James A. Scruggs, West Haven, Conn., assignor to the United States of America as represented by the Secretary of the Army

No Drawing. Filed Dec. 23, 1968, Ser. No. 786,487
Int. Cl. C01b 6/00
U.S. Cl. 23—204 4 Claims

A novel process for synthesizing aluminum hydride which employs aluminum and a dialkyl aluminum hydride reacted with molecular hydrogen at pressures between 800–2200 p.s.i.a.

3,664,812

PURIFICATION OF HYDROGEN PEROXIDE

Ernest B. Hoyt, Syracuse, N.Y., assignor to Allied Chemical Corporation, New York, N.Y.

No Drawing. Filed Mar. 16, 1970, Ser. No. 20,041
Int. Cl. C01b 15/02; C07c 49/68
U.S. Cl. 23—207 9 Claims

A method for purifying aqueous acidic solutions of hydrogen peroxide prepared by an organic anthraquinone process which comprises the addition to said solution of an oxide or hydroxide of magnesium, calcium, or barium either as a solid or as an aqueous solution in an amount to raise the pH of the solution to about 6 to 8.5 to effect precipitation of the impurities and recovering an essentially pure, stable hydrogen peroxide solution.

3,664,813

METHOD FOR MAKING GRAPHITE WHISKERS

Edward F. Hollander, Jr., Broomall, Pa., assignor to John P. Glass, trading as Cava Industries, Essington, Pa.

Filed July 17, 1969, Ser. No. 842,560
Int. Cl. C01b 31/04, 31/07
U.S. Cl. 23—209.1 9 Claims

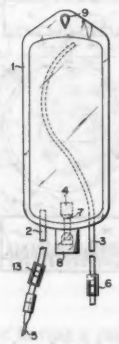
An oven for making whiskers from a vapor comprising a housing containing a chilled base plate, a first and second support post extending upwardly from the base plate, an upper and lower support plate mounted on the posts, a hollow heating element mounted between the support plates, and a stage within the heating element for supporting a substrate on which whiskers are grown. The substrate is covered with rhodium, and may be made of a material selected from the group consisting of stainless steel, beryllium oxide, alumina, copper, cobalt, and nickel. The method includes placing a substrate in a whisker deposition zone of whisker vapor, and depositing and growing whiskers on the substrate. The method also includes cooling the bottom of the whisker deposition zone to form convection currents of vapor passing upwardly through the zone, and feeding the vapor downwardly into the whisker deposition zone to clash with the upwardly flowing vapor convection currents and form a turbulence in the whisker deposition zone. A rotatable drum positioned below a nucleating zone in the oven and having a pocket that receives the substrate. A rack gear operated by a motor with a clutch moves the substrate from the nucleating zone to the drum pocket, and a motor gear system rotates the drum to wind the whiskers in the form of a roving onto the drum so that courses of a succeeding layer of roving lie between courses of the next preceeding layer having courses running in the same direction.

3,664,814

BLOOD CLEANER DEVICE

Norio Koremura, Tokyo, Japan, assignor to Jintan Terumo Co., Ltd., Tokyo, Japan

Filed Dec. 30, 1969, Ser. No. 889,245
Claims priority, application Japan, July 8, 1969, 44/53,666
Int. Cl. A61m 5/00
U.S. Cl. 23—258.5 6 Claims



A blood cleaner device comprises a flat bag-shaped container of flexible transparent sheet material, and liquid tubes inserted into the container at one end thereof, said

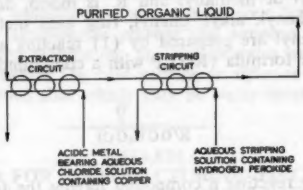
liquid tubes including at least one inlet tube for introducing blood into the container, a blood cleaning agent and a physiological salt solution, a blood take-out tube, and an outlet tube for discharging the blood cleaning agent. An open end of the outlet tube within the container is located near the end opposite to that of the container from which said liquid tubes are inserted therein, or near the upper end of the container when it is in an operative position, whereby the blood cleaning agent, after cleaning operation, is discharged from the container through the outlet tube by siphon action.

3,664,815

PURIFICATION OF ORGANIC SOLVENTS CONTAINING METALS BY PEROXIDE WASH

Eivind Wigstol, Kristiansand-S, Norway, assignor to Falconbridge Nickel Mines Limited, Toronto, Ontario, Canada

Filed Dec. 12, 1969, Ser. No. 884,406
Int. Cl. B01d *11/04*; C01g *3/04*
U.S. Cl. 23—312 R 7 Claims


PURIFIED ORGANIC LIQUID
EXTRACTION CIRCUIT
STRIPPING CIRCUIT
ACIDIC METAL BEARING AQUEOUS CHLORIDE SOLUTION CONTAINING COPPER
AQUEOUS STRIPPING SOLUTION CONTAINING HYDROGEN PEROXIDE

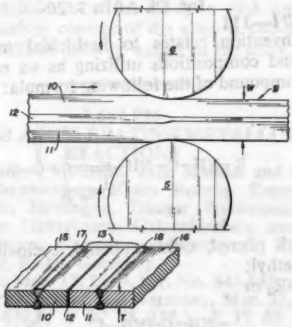
A method for the removal of residual metals, such as copper, from fouled organic solvents, such as amines, which are used in solvent extraction processes, in which the metal-containing amine is contacted with an aqueous stripping solution containing dilute concentrations of a soluble peroxide.

3,664,816

STEEL-TO-ALUMINUM TRANSITION PIECE

Walter D. Finnegan, Spokane, Wash., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Original application Oct. 25, 1966, Ser. No. 589,304, now Patent No. 3,495,319. Divided and this application June 16, 1969, Ser. No. 833,608
Int. Cl. B23p *3/06*
U.S. Cl. 29—196.2 4 Claims



A transition insert piece suitable for the fusion welding of aluminum to steel comprising a steel element and a strong aluminum alloy element pressure bonded together through a highly deformable aluminum bonding layer.

3,664,817

METHOD IN THE MANUFACTURE OF SO-CALLED PAPER WAX MATCHES AND APPARATUS FOR CARRYING OUT SAID METHOD

Hans Peter Struve, Lauenburg (Elbe), Germany, assignor to Aktiebolaget Siefvert & Fornander, Kalmar, Sweden

Filed Apr. 16, 1969, Ser. No. 816,708
Claims priority, application Sweden, Apr. 19, 1968, 5,246/68
Int. Cl. C06f *3/02, 3/00*
U.S. Cl. 44—47 14 Claims

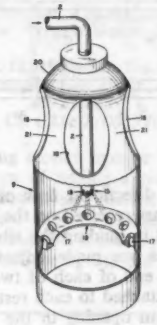
A paper strip, which is initially wound up into a supply roll and of which paper wax matches are to be made by drawing the paper strip through at least one impregnating bath and through a number of dies by means of which the impregnated paper is formed into a thread, is humidified on its way from the supply roll to the impregnating bath.

3,664,818

INJECTOR

John B. Kramer, Houston, Tex., assignor to Allied Chemical Corporation, New York, N.Y.

Filed June 26, 1970, Ser. No. 50,267
Int. Cl. F02m *21/04*
U.S. Cl. 48—180 R 2 Claims



Injector design for maximum air entrainment in the course of inter-mixture thereof with fuel to be conducted to the air intake system.

3,664,819

RESIN BONDED METAL-COATED DIAMOND OR CUBIC BORON NITRIDE ABRASIVE TOOLS CONTAINING AN INORGANIC CRYSTALLINE FILLER AND GRAPHITE

Richard H. Sioui, Holden, and Harvey M. Cohen, Randolph, Mass., assignors to Norton Company, Worcester, Mass.

Filed Nov. 14, 1969, Ser. No. 876,655
Int. Cl. B24b *1/00*; C08g *51/12*
U.S. Cl. 51—295 10 Claims

Organic bonded diamond or cubic boron nitride abrasive tools, showing particular utility in the dry grinding of metal-carbides, and tool steels, respectively, are produced by incorporating graphite, of fine particle size, and a reinforcing filler in the bond, and by employing metal-clad abrasive grits in the amount of 7 to 40%, by volume, of the abrading portion of the tool. The graphite is preferably of a flaky shape having an average diameter of

less than 300 microns, and is present in the bond in the amount of from 5 to 40 volume percent, with the total

filler content being from 15 to 70%; the remaining filler being, preferably, silicon carbide.

3,664,820

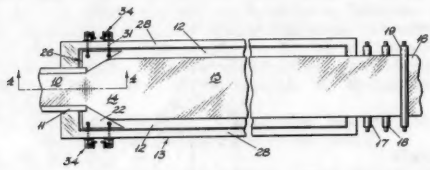
MOVABLE RESTRICTOR TILES IN FLOAT GLASS APPARATUS AND METHOD OF REGULATING GLASS RIBBON

Eldwin C. Montgomery, Modesto, Calif., assignor to Libbey-Owens-Ford Company, Toledo, Ohio

Filed Dec. 16, 1969, Ser. No. 885,430

Int. Cl. C03f

U.S. Cl. 65—99 A **8 Claims**



Controlling the directional flow of the initial buoyant body of molten glass received on the bath of a float glass apparatus to assist in guiding the ribbon down the bath. The restrictor tiles are made adjustable both pivotally and laterally. One end of each of two spaced, horizontal rods is pivotally attached to each restrictor tile. Each rod connects through an opening in the tank sidewall to an independent, conventional means capable of advancing and retracting same, thereby allowing independent adjustment thereof.

3,664,821

SLIMICIDAL COMPOSITION AND ITS USE

Bernard F. Shema, Glenside, Robert H. Brink, Jr., Doylestown, and Paul Swered, Philadelphia, Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.

No Drawing. Filed Jan. 2, 1970, Ser. No. 466

Int. Cl. A01n *9/00, 9/28*

U.S. Cl. 71—67 **12 Claims**

The present invention relates to certain processes and compositions useful for inhibiting the growth of slime in water employed for industrial purposes, particularly water employed in the manufacture of pulp and paper, water employed in cooling water systems, as well as other industrial waters. The novel processes and compositions of the present invention are processes or mixtures which show unexpected synergistic activity against microorganisms, including bacteria, fungi and algae, which produce slimes in aqueous systems or bodies which are objectionable from either an operational or aesthetic point of view. Specifically, the invention is directed to the use of compositions comprising a combination of bis-(trichloromethyl) sulfone with a mixture of 2-nitro-2-ethyl-1,3-dimorpholino propane, and N(2-nitrobutyl) morpholine.

3,664,822

DIALKENYL ESTERS OF ARYLOXYACETYL PHOSPHONIC ACIDS AS HERBICIDES

Delta W. Gier, Laurinburg, N.C., assignor to Baychem Corporation, New York, N.Y.

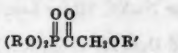
No Drawing. Division of application Ser. No. 675,356, Oct. 16, 1967, now Patent No. 3,562,361, dated Feb. 9, 1971, which is a continuation-in-part of applications Ser. No. 412,263, Nov. 18, 1964, now Patent No. 3,382,060, and Ser. No. 449,640, Apr. 20, 1965, now Patent No. 3,378,610. This application Feb. 24, 1970, Ser. No. 17,000

The portion of the term of the patent subsequent to May 7, 1985, has been disclaimed

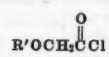
Int. Cl. A01n *9/36*

U.S. Cl. 71—86 **8 Claims**

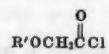
Compounds of the formula



where R is alkyl, phenyl, alkylphenyl, chloroalkyl, cyanoalkyl, allyl or methallyl and R′ is mono, di or trihalophenyl, phenyl, alkyl, phenyl, ring halo methyl phenyl, alkoxyphenyl are prepared by (1) reacting a compound having the formula $(RO)_3P$ with a compound having the formula,



or (2) by reacting a compound having the formula



The products are useful as desiccants and as herbicides. The alkyl compounds are particularly effective as selective herbicides for broadleaf plants.

3,664,823

HERBICIDAL 3-(SUBSTITUTED UREIDO) CROTONAMIDES AND CROTONATES

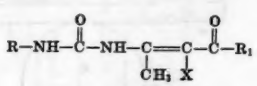
Harvey M. Loux, Hockessin, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Continuation-in-part of application Ser. No. 775,568, Sept. 30, 1968, which is a continuation-in-part of application Ser. No. 678,548, Oct. 27, 1967, which in turn is a continuation-in-part of application Ser. No. 533,223, Mar. 10, 1966. This application Dec. 4, 1969, Ser. No. 882,343

Int. Cl. A01n *9/20*

U.S. Cl. 71—111 **2 Claims**

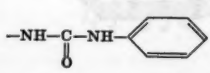
This invention relates to herbicidal methods, compounds and compositions utilizing as an essential ingredient a compound of the following formula:



wherein

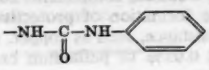
R is alkyl, phenyl, o-fluorophenyl, cycloalkyl, or cycloalkylmethyl;

R_1 is —OR_2 or



R_2 is alkyl, cyclohexyl, phenyl, substituted phenyl, benzyl or substituted benzyl;

X is methyl or halogen, with the limitation that when R_1 is



R is restricted to phenyl or o-fluorophenyl.

Typical of the compounds of this invention is 2-bromo-N - (phenylcarbamoyl) - 3 - (3 - phenylureido)crotonamide which is useful as an herbicide.

3,664,824

AGGLOMERATED METAL SHOT

Frederick W. Meadus and Ira E. Puddington, Ottawa, Ontario, Canada, assignors to Canadian Patents and Development Limited, Ottawa, Ontario, Canada

No Drawing. Filed Dec. 26, 1968, Ser. No. 787,278
Claims priority, application Canada, Feb. 6, 1968, 11,770
Int. Cl. B22f 9/00
U.S. Cl. 75—.5 R **2 Claims**

Agglomerated metal shot preparation by adding metal powder and aqueous fluid to a non-aqueous liquid phase, agitating to agglomerate powder and aqueous fluid, and impacting and ricocheting the agglomerates until strong pellets are formed (by cold-welding or aqueous adhesive) e.g. giving bird shot which may be water-decomposable.

3,664,825

METHOD FOR MANUFACTURING ZIRCONIUM ALLOYS AND ALLOYS MANUFACTURED ACCORDING TO THE METHOD

Mats Soren Bergqvist, Olof Krister Kallstrom, Per Goran Olof Lagerberg, and Nils Axel Gunnar Okvist, Sandviken, Sweden, assignors to Sandvikens Jernverks Aktiebolag, Sandviken, Sweden

No Drawing. Filed Feb. 9, 1970, Ser. No. 10,042
Claims priority, application Sweden, Feb. 21, 1969, 2,402/69
Int. Cl. C22c 15/00
U.S. Cl. 75—10 **9 Claims**

In making a zirconium alloy of the known type, which, besides zirconium and an insignificant amount of impurities, essentially contains only 0.2–2.5 wt. percent tin and in total 0.1–3.0 wt. percent of one or more of the elements iron, chromium, nickel and niobium and which at higher temperatures have β-phase structure and at lower temperatures have α-phase structure, the inventive object is to give the alloy such an α-phase structure that when the β-phase is transformed to α-phase, a raised ductility and improved surface properties are obtained. This object is met by including, amongst the components when the alloy is manufactured by melting, one or more metallic carbides the metallic carbide so added being in such an amount that the final carbon content of the alloy is 140–300 parts of weight per million parts of weight of the alloy.

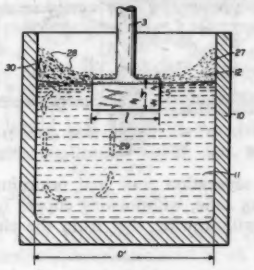
3,664,826

PROCESS FOR ACCELERATING METALLURGICAL REACTIONS

Friedrich Kraemer, Mulheim, Jorn Mandel and Siegfried Mayer, Gelsenkirchen, Klaus Rohrig, Essen, Hans-Peter Schulz, Hattingen, Hilmar Weidenmuller and Klaus Dieter Haverkamp, Gelsenkirchen, and Jürgen Motz, Ratingen, Germany, assignors to Rheinstahl Huttenwerke, Essen, Germany

Filed Mar. 17, 1969, Ser. No. 843,868
Claims priority, application Germany, Mar. 23, 1968, P 17 58 038.0, P 17 58 039.1, P 17 58 040.4, P 17 58 041.5
Int. Cl. C21c 7/02
U.S. Cl. 75—50 **14 Claims**

Apparatus including means for adjusting vertically the level of a mechanical stirring member with respect to the vertical level of a melt, e.g. the vertical level of the interface between the top surface of an iron melt and slagging or the like ingredients floating on such iron melt surface especially in a circular upright ladle with a discharge aperture, and method of using such stirring member, e.g. to enhance or accelerate contact and reaction between such melt and floating ingredients, to carry out metallurgical reactions, as well as tough cast iron containing spherical graphite producible thereby.



3,664,827

METHOD FOR REFINING MOLTEN IRON OR MOLTEN IRON ALLOYS

Ryo Ando and Tsutomu Fukushima, Kanagawa-ken, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 22, 1969, Ser. No. 818,283
Claims priority, application Japan, Apr. 24, 1968, 43/27,062
Int. Cl. C21c 7/00, 7/04
U.S. Cl. 75—51 **3 Claims**

Method for refining molten iron or molten iron alloys which comprises steps of adding a reactant and stirring the upper layer portion of said molten metal while blowing oxygen thereonto, and substantial inertia of movement and natural convection caused by pouring said molten metal into the ladle being utilized to enforce stirring effect in the ladle.

3,664,828

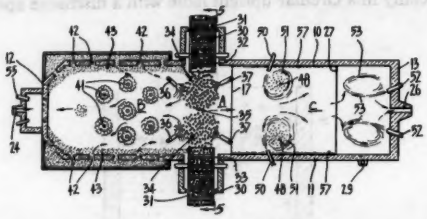
REVERBERATORY SMELTING OF COPPER CONCENTRATES

Howard Knox Worner, North Balwyn, Victoria, Australia, assignor to Conzinc Riotinto of Australia Limited, Melbourne, Victoria, Australia

Original application Nov. 18, 1966, Ser. No. 595,510, now Patent No. 3,527,449, dated Sept. 8, 1970. Divided and this application Feb. 17, 1969, Ser. No. 817,213
Claims priority, application Australia, Nov. 22, 1965, 66,820/65
Int. Cl. C22b 15/00, 15/14
U.S. Cl. 75—73 **15 Claims**

The invention concerns a method for continuously smelting and converting copper concentrates including providing at remote ends of the furnace copper and slag outlets, forming in the furnace a smelting zone, a converting zone and a slag separation zone with the converting zone being between the smelting zone and the copper outlet and the slag separation zone being between the smelting zone and the slag outlet, feeding concentrates into the smelting zone, forming a restricted passage in the smelting zone between the converting zone and the slag separation zone, jetting oxidising gas into the molten material in the smelting zone, causing matte formed in the smelting zone to flow into the converting zone, jetting oxidising gas into the molten material in the converting zone to convert matte to copper, causing slag

formed in the converting zone to flow through the restricted passage into the slag separation zone countercurrent to the flow of matte, separating matte from slag



in the slug separation zone and returning the matte to he converting zone, withdrawing copper from the copper outlet and withdrawing slag from the slag outlet.

3,664,829

METHOD AND COLLECTOR FOR EXTRACTING METALS FROM AN AQUEOUS SOLUTION

Dale M. Matthews, Mountain View, Alaska (Drawer 8869, Mountain View Station, Anchorage, Alaska 99504)

Continuation-in-part of application Ser. No. 658,502, Aug. 4, 1967. This application Jan. 7, 1970, Ser. No. 1,202

Int. Cl. C22b *11/04, 15/12*

U.S. Cl. 75—108 **5 Claims**

Metals belonging to a group of metals having an affinity for phosphorus are extracted from an aqueous solution by exposing phosphorus to said solution, said metals collecting on the phosphorus and later being separated therefrom. To provide a large contact area the phosphorus is melted onto a nonreactive matrix, and to prevent pollution of the aqueous solution by the phosphorus the matrix is enclosed in an envelope of non-reactive filter material.

3,664,830

HIGH TENSILE STEEL HAVING HIGH NOTCH TOUGHNESS

Akira Kambayashi and Shun-ichi Shimada, Kawasaki, and Takashi Ehara, Tokyo, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Kawasaki-shi, Japan

No Drawing. Filed June 15, 1970, Ser. No. 46,475

Claims priority, application Japan, June 21, 1969, 44/48,794

Int. Cl. C22c *37/10, 39/14*

U.S. Cl. 75—124 **2 Claims**

A high tensile steel comprising 0.12–0.21% of carbon, 0.70–1.00% of manganese, 0.20–0.35% of silicon, 0.40–0.65% of chromium, 0.15–0.25% of molybenum, 0.03–0.08% of vanadium, 0.01–0.03% of titanium, 0.0005–0.005% of boron, 0.020–0.060% of aluminum, 0.008–0.020% of nitrogen and the balance being iron and impurities, treated by hardening and tempering to provide the steel with a yield point of more than 70 kg./mm.^{2}, a tensile strength of more than 80 kg./mm.^{2} and an excellent notch toughness and weldability.

3,664,831

LEAD ALLOYS HAVING IMPROVED CORROSION RESISTANCE

Hubert Graefen, Lampertheim, and Dieter Kuron, Mannheim, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen am Rhine, Germany

Filed Mar. 17, 1970, Ser. No. 20,179

Claims priority, application Germany, Mar. 20, 1969, P 19 14 210.0

Int. Cl. C22c *11/00*

U.S. Cl. 75—166 **5 Claims**

Lead alloys distinguished by improved corrosion resistance, particularly against sulfuric acid, and improved creep resistance. Suitable alloys of this kind are lead alloys containing—besides components for reducing grain size, assisting the formation of protective layers and increasing creep resistance, such as copper, nickel, tellurium and tin—at least 0.05% of palladium based on the total weight of the alloy.

3,664,832

LEAD ALLOY

Neil E. Paton, Cambridge, Mass., assignor to Ionics, Incorporated, Watertown, Mass.

No Drawing. Filed July 25, 1969, Ser. No. 845,073

Int. Cl. C22c *11/00*

U.S. Cl. 75—166 D **2 Claims**

A lead alloy anode with improved resistance to corrosion is provided for sulfate electrolysis which anode consists essentially by weight of not more than 5% thallium, not more than 1.8% tin, up to 0.2% cobalt and the remainder lead and incidental impurities. Further improvement result if the cast alloy anode is "hot worked" by rolling the anode to less than one-quarter its original cast thickness while maintaining the temperature between 200°–300° C.

3,664,833

METHOD OF TRANSFERRING AN ELECTROSTATIC IMAGE TO A DIELECTRIC SHEET

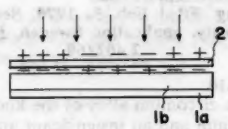
Susumu Tanaka, Sakai, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed June 10, 1970, Ser. No. 45,124

Claims priority, application Japan, June 16, 1969, 44/47,491

Int. Cl. G03g *13/00, 13/15*

U.S. Cl. 96—1 **7 Claims**



An electrostatic image is transferred from a photoconductive layer onto a dielectric sheet of 10μ to 200μ thickness by applying an AC corona discharge to the dielectric sheet and projecting a uniform light onto the dielectric sheet from an incandescent light source. The image on the dielectric sheet is developed with toner and the dielectric sheet is stripped from the photosensitive material.

3,664,834

MIGRATION IMAGING METHOD EMPLOYING ADHESIVE TRANSFER MEMBER

Alan B. Amidon, Penfield, and Joseph G. Sankus, Fairport, N.Y., Nicholas L. Petruzzella, Columbus, Ohio, and Joan R. Ewing, Rochester, N.Y., assignors to Xerox Corporation, Rochester, N.Y.

Filed Dec. 23, 1968, Ser. No. 786,867

Int. Cl. G03g *13/16*

U.S. Cl. 96—1.4 **20 Claims**

An imaging member comprising a supporting substrate and an overlayer on said substrate comprising a soluble, electrically insulating binder layer containing particles dispersed in said soluble binder is processed to substantially completely remove said soluble binder and form an image and a background pattern of particles on said substrate, which is then contacted with a transfer member

which is then stripped away whereby the image or the background pattern of migrate particles is selectively released to said transfer member.

3,664,835

PHOTOGRAPHIC PRODUCT, COMPOSITION AND PROCESS COMPRISING AN ANHYDRO DIHYDRO AMINO REDUCTONE DEVELOPING AGENT

Mary J. Youngquist, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Oct. 2, 1969, Ser. No. 863,363
Int. Cl. G03c *1/42, 5/30, 5/54*
U.S. Cl. 96—3 21 Claims

Photographic developing agents which are anhydro dihydro reductone silver halide developing agents such as anhydro dihydro amino reductone silver halide developing agents provide reduced stain without loss of desired sensitometric properties at reduced concentrations in a diffusion transfer system. These can be used in combination with other photographic developing agents such as aminomethyl hydroquinone developing agents, cinnamic acid developing agents, lactone developing agents or developing agent precursors, and the like. They are specially useful in a black and white silver halide diffusion transfer process.

3,664,836

TANNING PROCESS FOR FORMING A PHOTOGRAPHIC RELIEF IMAGE

Laura K. Case, Winchester, Mass., assignor to Itek Corporation, Lexington, Mass.

No Drawing. Filed May 19, 1969, Ser. No. 825,994
Int. Cl. G03c *5/00*
U.S. Cl. 96—35 17 Claims

A process is disclosed for forming a photographic relief image from a copy medium which has a base coated with a gelatin binder which contains a photoconductor. The photoconductor is of the type which becomes reversibly activated upon being struck by light or other activating radiation and is capable of causing the reduction of reducible ions in its activated state. The copy medium is first exposed to an image pattern of activating radiation such as visible light to reversibly activate the photoconductor at the image-struck area. The exposed areas are subsequently contacted with image-forming materials which contain reducible ions such as silver ions to form a germ image. After the germ image has been formed the hardenable binder is contacted with a tanning developer which hardens the binder at the image-struck areas. Remaining portions of the unhardened binder are washed away which leaves a relief image formed from hardened gelatin at the image-struck area.

The photographic relief image formed by the process of this invention is useful as a photographic transparency, diazo master, dye transfer matrix, lithographic plate, etc.

3,664,837

PRODUCTION OF A LINE PATTERN ON A GLASS PLATE

Charles C. Stanley, Canoga Park, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Jan. 16, 1970, Ser. No. 3,435
Int. Cl. G03c *5/00, 11/00*
U.S. Cl. 96—38.3 4 Claims

Microelectronic circuits are produced by evaporating a photosensitive compound such as a silver halide onto a chip which is then exposed to radiation such as light, or an electron beam whose motion may be controlled by a computer or similar device. The chip is then developed leaving behind the metallic conductive circuit, and the undeveloped portion is removed preferably by heating.

3,664,838

TREATMENT OF AND DEVELOPING COMPOSITION FOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIALS

Hiroyuki Amano and Kazuo Shirasu, Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

No Drawing. Filed Apr. 16, 1970, Ser. No. 29,250
Claims priority, application Japan, Apr. 16, 1969, 44/29,577
Int. Cl. G03c *7/00, 5/30*
U.S. Cl. 96—56 7 Claims

Photographic light sensitive developing compositions containing inositolpolyphosphoric acid or an alkali metal salt of inositolpolyphosphoric acid to prevent staining and aerial fog are disclosed.

3,664,839

MULTIPLE SCINTILLATOR LAYERS ON PHOTOGRAPHIC ELEMENTS

Evan Thomas Jones, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Sept. 16, 1969, Ser. No. 858,501
Int. Cl. G03c *1/92*
U.S. Cl. 96—82 9 Claims

Photographic elements containing multiple scintillator layers, wherein one of the layers is a fine-particle-size scintillator layer and at least one other scintillator is a coarse-particle size layer comprising particle sizes of about 0.5 to about 2.0 microns, are found to be very useful in electron-beam recording and playback. The coarse-particle-size layer facilitates easy alignment of the electron beam and is generally removed after the recording operation. The fine-grain layer is retained intact with the image record for read-out of the recorded information.

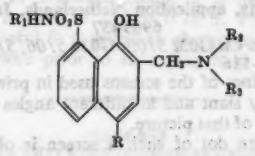
3,664,840

DIAZOTYPE PHOTOPRINTING MATERIAL

Tadashi Saito, Kawasaki-shi, Masaru Shimada, Yokohama-shi, and Kiyoshi Sakai, Tokyo, Japan, assignors to Kabushiki Kaisha Ricoh, Tokyo, Japan

No Drawing. Filed Apr. 1, 1969, Ser. No. 812,428
Claims priority, application Japan, Apr. 17, 1968, 43/25,763
Int. Cl. G03c *1/58, 1/54*
U.S. Cl. 96—91 15 Claims

A diazotype photoprinting material containing a coupler compound having the following general formula.



(I)

wherein R is a lower alkyl radical of from 1 to 4 carbon atoms, R_1 is hydrogen, lower alkyl-, aralkyl radical or

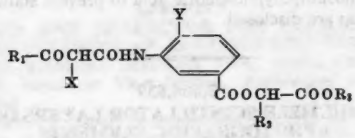
wherein R'_2 and R'_3 are each lower alkyl radicals, and n is integer of from 1 to 3, and R_2 and R_3 are same or different lower alkyl- or alkylene radicals and may be linked together with carbon, oxygen, sulfur or nitrogen atom to form a heterocyclic ring.

3,664,841
LIGHT-SENSITIVE SILVER HALIDE COLOR PHOTOGRAPHIC EMULSION CONTAINING YELLOW-FORMING COUPLER

Masakuni Iwama, Isaburo Inoue, Yutaka Takei, Kenro Sakamoto, and Takaya Endo, Tokyo, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

No Drawing. Filed Nov. 28, 1969, Ser. No. 880,954
Int. Cl. G03c *1/40*
U.S. Cl. 96—100 **8 Claims**

A compound of the general formula



wherein R_1, R_2, R_3, X and Y as defined in the claims is found to be useful as a yellow coupler in a light-sensitive silver halide emulsion. The compound when used as said yellow coupler is characterized in that it can yield a yellow dye image with good stability against moisture and light attack.

3,664,842
THERMOGRAPHIC COPY SHEET CONTAINING GUANIDINE COMPOUNDS

Albert W. Leclair, Hudson, N.H., assignor to Nashua Corporation, Nashua, N.H.

No Drawing. Filed Apr. 13, 1970, Ser. No. 28,067
Int. Cl. G03c *1/02*
U.S. Cl. 96—114.1 **4 Claims**

A thermographic copy system utilizing certain U.V. inactivatable reducing agents may be rendered inactivatable by visible light by a dye sensitizer in combination with certain guanidine-based compounds which augment the sensitizing effect.

3,664,843
SCREEN COMBINATION

Leendert Antonius Fontijn, Delft, Netherlands, assignor to Nederlandse Centrale Organisatie Voor Toegepast-Natuurwetenschappelijk Onderzoek, The Hague, Netherlands

Filed June 9, 1970, Ser. No. 44,732
Claims priority, application Netherlands, June 19, 1969, 6909437
Int. Cl. G03f *5/00;* **G03c** *5/06, 5/04*
U.S. Cl. 96—116 **7 Claims**

The head lines of the screens used in printing a picture are preferably slant and at different angles in relation to the head lines of that picture.

Every screen dot of such a screen is obtained at the device described by exposure of a photo-sensitive layer, which is provided on to an etchable substrate, with the aid of an electron beam.

In the process a head line of the picture moves according to its own lengthwise direction in a plane perpendicular to the optical axis of the electron gun.

By rendering the electron beam for manufacturing specific dots of the screen a declination perpendicular to the said head line and/or in the direction of the said head line of the picture a screen is created with its two head lines slant in relation to the head lines of the picture.

3,664,844
EDIBLE COLLAGEN FILM

Albert T. Miller, Somerville, N.J., assignor to Devro, Inc.

No Drawing. Filed Feb. 10, 1970, Ser. No. 10,305
Int. Cl. A23j *1/10;* **A22c** *13/00*
U.S. Cl. 99—18 **23 Claims**

Edible collagen continuous films, which are strong and have good wet strength, which are especially useful when used to hold and cover wet meat emulsions to make meat bar snack products, are prepared by forming and drying a sheet of acid-swollen hide corium-derived collagen treated with fungal proteases derived from *Aspergillus oryzae* and *Aspergillus flavus-oryzae,* which also contains a plasticizer and preferably further contains a solubilized soy protein and/or an edible cellulose, and then preferably treating the dried film with gaseous ammonia when greatly enhanced wet strength is desired.

3,664,845
MOLECULAR FRACTIONATION BY PULSED CENTRIFUGATION

Herman H. Friedman, Bayside, N.Y., assignor to General Foods Corporation, White Plains, N.Y.

No Drawing. Filed Nov. 25, 1970, Ser. No. 92,909
Int. Cl. B01d *15/08*
U.S. Cl. 99—57 **5 Claims**

A means for the rapid, efficient fractionation of water soluble substances by means of passage through a molecular fractionating gel has been developed which employs a pulsed centrifugation technique. This development is a useful food processing operation to quickly and efficiently separate valuable food components such as flavors and proteins from aqueous solutions such as coffee extract and whey.

3,664,846
PROCESS FOR PREPARING INSTANT GRITS

Roy G. Hyldon, Crystal Lake, Ill., assignor to The Quaker Oats Company, Chicago, Ill.

No Drawing. Filed Jan. 14, 1970, Ser. No. 2,939
Int. Cl. A23l *1/10*
U.S. Cl. 99—83 **4 Claims**

Emulsifier free instant-type corn grits food product are prepared by: (A) admixing corn grits, water, and polysaccharide gum; (B) heating the mixture in a first heating step; (C) heating the above heated mixture in a second heating step which consists of a critical temperature range; (D) drying the mixture by forming the heated mixture in a thin sheet on a drum drier with the forming being conducted within a critical time period from the last heating step; and (E) comminuting the cooked, dried sheet.

3,664,847
PROCESS FOR PREPARING INSTANT CORN GRITS

Roy G. Hyldon, Crystal Lake, Ill., assignor to The Quaker Oats Company, Chicago, Ill.

No Drawing. Filed Jan. 14, 1970, Ser. No. 2,940
Int. Cl. A23l *1/10*
U.S. Cl. 99—83 **4 Claims**

Instant corn grits are prepared by a process comprising the steps: (A) admixing corn grits, critical amounts of water, and critical amounts of polysaccharide gum; (B) rapidly heating the mixture to a critical temperature for a critical time period; (C) immediately drying the heated

mixture in the form of a thin sheet on a drum drier; and (D) collecting and comminuting the cooked dried sheet.

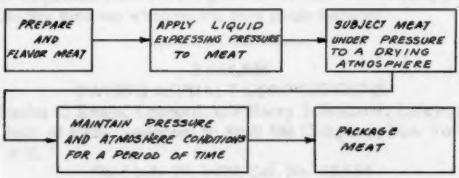
3,664,848
PROCESS OF PRODUCING A SOY-CONTAINING READY-TO-EAT BREAKFAST CEREAL
William T. Bedenk, Springfield Township, Hamilton County, and Edward R. Purves, Forest Park, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio
No Drawing. Filed June 29, 1970, Ser. No. 50,923
Int. Cl. A23l *1/10*
U.S. Cl. 99—83 10 Claims

Production of high protein soy-containing breakfast cereals by intimately mixing a soy protein source, proteolytic enzyme and gelatinized cereal grain, thereafter processing this mixture into a ready-to-eat breakfast cereal having a protein content of greater than 20%. Water, extracted from the gelatinized cereal grain together with the proteolytic enzyme, causes a partial hydrolysis of the soy protein thereby making it more palatable.

3,664,849
PRODUCTION OF MEAT SNACK PRODUCT AND PRODUCT
Robert F. Autry, Neshanic Station, N.J., assignor to Devro, Inc.
No Drawing. Filed Feb. 10, 1970, Ser. No. 10,304
Int. Cl. A22c *18/00;* A23l *1/00*
U.S. Cl. 99—107 11 Claims

Snack type products such as dried sausage meats or other dried foods are produced in the shape of relatively flat bars similar to candy bars by processes adaptable to high speed production methods which involve continuously extruding wet emulsions of the edible food component over a moving belt which supports an edible collagen film having good wet burst strength, and then covering the emulsion with an upper layer of the edible collagen film and applying pressure thereto to form a laminate which is then dried to a moisture content of 20 percent or less, cut to size, and overwrapped; the laminate form allowing the easy handling of the meat emulsion as a continual blanket.

3,664,850
PROCESS FOR PRESERVING MEATS
Willliam E. Kentor, 228 Maple Ave., Highland Park, Ill. 60035
Filed Dec. 3, 1969, Ser. No. 881,694
Int. Cl. A23b *1/00, 1/02, 1/04*
U.S. Cl. 99—157 1 Claim


PREPARE AND FLAVOR MEAT
APPLY LIQUID EXPRESSING PRESSURE TO MEAT
SUBJECT MEAT UNDER PRESSURE TO A DRYING ATMOSPHERE
MAINTAIN PRESSURE AND ATMOSHERE CONDITIONS FOR A PERIOD OF TIME
PACKAGE MEAT

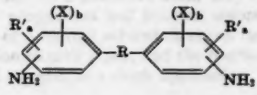
A process for preserving fresh comminuted and/or whole meats which comprises pre-treating the meats with an appropriate flavoring or condiment mixture, applying positive liquid-expressing pressure to the pre-treated meats to force moisture therefrom and subjecting the meats while under liquid-expressing pressure to a drying atmosphere in motion relative to said meat and under low humidity and high temperature conditions for a period of time sufficient (i.e. about 18 hours per pound of pre-treated meat, depending upon the exposed surface area thereof) to rapidly remove moisture to a maximum of about 50% by weight of the finished meats and thereby impart shelf stability to the meats under ambient air conditions without need of refrigeration. The dried meats are then sliced and packaged as desired.

3,664,851
COMPOSITIONS OF MATTER
Willem Hendrik Feenstra and Johann Georg Keppler, Vlaardingen, Netherlands, assignors to Lever Brothers Company, New York, N.Y.
No Drawing. Filed Oct. 13, 1969, Ser. No. 865,990
Claims priority, application Luxembourg, Oct. 14, 1968, 57,084/68
Int. Cl. A23d *5/04*
U.S. Cl. 99—163 5 Claims

Improved fatty acid products of enhanced flavour characteristics have incorporated autoxidation flavour counteractants of the formula RCH:CHCH:CHZ where R is an alkyl group containing up to 9 carbon atoms and Z is an organoleptically acceptable polar group. The fatty acid products include edible fats and oils particularly tallow and soybean oil, and their products such as margarine. The counteractants may be free or combined fatty acids or aldehydes, which are effective in minute amounts, and they may be incorporated at least in part by precursors added to convert to the counteractant in the fatty acid product during storage.

3,664,852
ELECTROLESS COPPER PLATING SOLUTION AND PROCESS
Kenneth J. Hacias, Detroit, Mich., assignor to Hooker Chemical Corporation, Niagara Falls, N.Y.
No Drawing. Filed Dec. 30, 1969, Ser. No. 889,309
Int. Cl. C23c *3/00*
U.S. Cl. 106—1 13 Claims

A plating solution suitable for the electroless deposition of copper on ferrous metal surfaces which comprises an aqueous acidic solution containing copper ions; chloride, bromide, or iodide ions; a polyalkylene glycol; and a dianiline compound of the structure:



wherein R is an alkyl group containing from about 1 to 6 carbon atoms in a straight or branched chain; R' is an alkyl group containing from about 1 to 4 carbon atoms in a straight or branched chain; X is halogen; and *a* is a number from 0 to 2; *b* is 0 or 1. This solution is particularly useful in forming an electroless copper coating on steel wire prior to subjecting it to a wire drawing operation.

3,664,853
IMPREGNATED FIRED REFRACTORY SHAPE AND METHOD OF PRODUCING SAME
Regis J. Leonard, Catasauqua, and Gene C. Ulmer, Bethlehem, Pa., assignors to Bethlehem Steel Corporation
Filed Mar. 6, 1970, Ser. No. 17,091
Int. Cl. C04b *35/04, 35/52*
U.S. Cl. 106—58 25 Claims

A high-fired basic refractory shape having an apparent porosity of about 10% to about 20%, the open pores

of which contain a skeletal-like structure of a material compatible with the host material of the shape. Fine-grain carbon is uniformly distributed on the skeletal-like structure, the walls of the pores and uniformly throughout the shape. A major portion of the open pores have an effective pore diameter of about 7 microns to about 0.5 micron. The shape has increased resistance to penetration and erosion by slags present in steelmaking furnaces and has hot crushing strength equivalent to or better than prepared conventional shapes.

A conventional high-fired basic refractory shape is impregnated with a solution of a substance capable of being treated to form a material compatible with the host material of the shape. The impregnated and treated material forms a skeletal-like structure in the open pores of the shape. The shape is impregnated a second time with a carbonaceous material which upon pyrolysis yields a fine-grained carbon which is uniformly distributed throughout the shape and upon the skeletal-like formation and the walls of the open pores in the shape.

3,664,854

QUICK SETTING AND QUICK HARDENING CEMENT AND METHOD FOR PRODUCING THE SAME

Hiroshi Kokuta, Chigasaki, Japan, assignor of a fractional part interest to Ajinomoto Co., Inc., Tokyo, Japan

Filed Feb. 16, 1970, Ser. No. 11,518
Claims priority, application Japan, Feb. 17, 1969, 44/11,008
Int. Cl. C04b 7/32
U.S. Cl. 106—90 7 Claims

A quick setting and quick hardening cement and a method for producing the cement is disclosed. The cement contains aluminous cement, lime or lime containing material, portland cement, and a ketocarboxylic acid or its salt as a chelating agent. The chelating agent froms a complex selectively with Ca ion in the alkaline state and after a certain period, the complex will decompose or decrease. Therefore, the time to begin setting can be controlled to 1–90 minutes and sufficient hardening takes place in a short time.

3,664,855

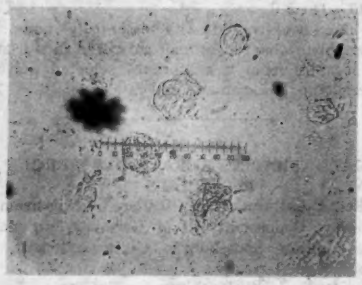
SIZE FOR FIBERS AND GLASS FIBERS COATED THEREWITH

Albert R. Morrison, Newark, and Harold L. Haynes, Granville, both of Ohio, assignors to Owens-Corning Fiberglas Corporation

Continuation-in-part of application Ser. No. 696,156, Jan. 8, 1968, now abandoned. This application Dec. 16, 1969, Ser. No. 885,599

Int. Cl. C09j *3/06*

U.S. Cl. 106—212 23 Claims



A size for lubricating fibers, including glass fibers, which is a water dispersion of a solid unctuous material, as for example a solid wax, fat, or gelled or otherwise solidified oil, and a starch ether of a cyclic hydrocarbon, as for example a starch ether of an aryl compound, an aralkyl compound, an alkaryl compound, a cycloalkyl compound and a cycloalkenyl compound, or homologues thereof. The wax may be an animal, vegetable, mineral, or synthetic wax which is unctuous and insoluble in water. The oils can be gelled by adding any gelling agent, and preferably a thixotropic gelling agent to the oil. The starch ethers or, as the case may be, are only partially cooked so that unburst starch granules are retained, and this dispersion is intimately mixed with the unctuous solid emulsified particles. Other ingredients such as cationic lubricants, coloring matter, bactericides, waxes having particular characteristics, etc. can be added to provide their separate functions. The combination of the above defined partially burst starch granules of etherified starch, and the emulsified particles of the solid unctuous material have very low migration from coated glass fibers, and when dried, provide low tensions when pulled over guide surfaces.

3,664,856

PAVING ASPHALT COMPOSITIONS

Charles C. Evans, Concord, and Harry J. Sommer, Lafayette, both of Calif., assignors to Shell Oil Company, New York, N.Y.

Filed July 27, 1970, Ser. No. 58,690

Int. Cl. C08h *13/00*, *17/22*; C08i *1/46*

U.S. Cl. 106—278 8 Claims

Asphalt compositions suitable for mixing with aggregate at high temperatures are produced by incorporating into an asphalt cement a minor amount, i.e., from 0.01 to 1.5 percent by weight, of a low-boiling hydrocarbon fraction. The resulting asphalt compositions have substantially improved compaction properties and are highly durable.

3,664,857

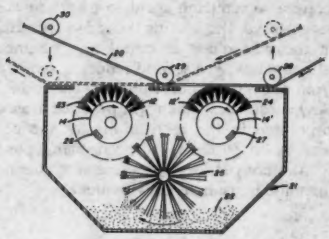
XEROGRAPHIC DEVELOPMENT APPARATUS AND PROCESS

Howard A. Miller, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 6, 1970, Ser. No. 9,225

Int. Cl. G03g *13/08*, *15/08*

U.S. Cl. 117—17.5 10 Claims



Electroscopic toner material is applied to electrostatic charge patterns with at least one metallized fur brush having individual flexible filaments coated with a thin layer of an electrically conductive metal. The apparatus contains two metallized fur brushes, one having a low electrical conductivity and one having a high conductivity.

3,664,858

HEAT-SENSITIVE COPY-SHEET

William A. Huffman, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 18, 1970, Ser. No. 12,427

Int. Cl. B41m *5/18*

U.S. Cl. 117—36.8 14 Claims

Heat-sensitive copy-sheet coatings comprise highly methanol-soluble amine adducts of organic acidic materials. The sheets may be clear and transparent, becoming light-diffusing on heating. In a preferred form they contain amine-reactive color progenitors and become colored on heating. The presence of a mutual solvent does not cause the color-forming reaction to take place, and the reactants may therefore be coated together in a single application.

3,664,859

PULSED METHOD FOR IMPREGNATION OF GRAPHITE

Ronald L. Beatty, Oak Ridge, and Dale V. Kiplinger, Concord, both of Tenn., assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed Mar. 4, 1969, Ser. No. 804,265

Int. Cl. C01b *31/00*

U.S. Cl. 117—46 CG 1 Claim

An improved method for preparing carbon-impregnated graphite bodies is provided comprising pulsing the graphite bodies between a vacuum atmosphere and a pressurized hydrocarbon atmosphere at elevated temperatures. The resulting graphite bodies, which are impregnated with pyrolytic carbon deposits, have helium permeabilities of less than 1×10^{-11} cm²/sec.

3,664,860

ELECTROLESSLY NICKEL PLATING ON A NON-METALLIC BASIS MATERIAL

Nobuyuki Kamiya, Yokohama-shi; Kiyotaka Funada, Chigasaki-shi; Takashi Shinohara, Yokohama-shi, and Hiroko Imai, Tokyo, all of Japan, assignors to Nihon Kagaku Kizai Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 8, 1969, Ser. No. 883,311
Claims priority, application Japan, Dec. 6, 1968, 43/89357
Int. Cl. C23c *3/02*
U.S. Cl. 117—47 A 6 Claims

A process for depositing nickel on a non-metallic basis material from a chemical nickel plating bath containing a hypophosphite as a reducing agent to form a nickel coating on the basis material, the coating being indispensable for the practice of the subsequent electroplating, characterized in that the bath contains, as a second reducing agent, a member selected from the group consisting of 1-ascorbic acid, its salts, and any substances which will produce 1-ascorbic acid when incorporated in the bath as one of the components thereof, thereby to eliminate the sensitizing pre-treatment required for the conventional processes for chemically plating a non-metallic basis material with nickel.

3,664,861

COATING PROCESS

Seizo Okamura, Kyoto-fu; Koji Odan, Kanagawa-ken, and Tsutomu Maruyama, Kanagawa, all of Japan, assignors to Kansai Paint Company Limited, Amagasaki-shi, Hyogo-ken, Japan

Filed Feb. 26, 1969, Ser. No. 802,658
Claims priority, application Japan, Mar. 1, 1968, 43/12874
Int. Cl. B44d *1/50*
U.S. Cl. 117—93.31 8 Claims

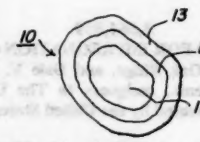
A process for coating articles which comprises the steps of causing a reaction between a methacrylic acid ester having hydroxyl groups and an isocyanate compound having at least two isocyanate groups in its molecule to obtain a partially urethanated compound, causing a reaction between said partially urethanated compound and a polyester having a hydroxyl group to produce an unsaturated polyester composition, applying said unsaturated polyester composition to articles to be coated, and irradiating ionizing radiation on the films of said unsaturated polyester composition formed on said articles, thereby obtaining hard but not brittle coatings on said articles.

3,664,862

ELECTRON ENERGY SENSITIVE PHOSPHORS FOR MULTI-COLOR CATHODE RAY TUBES

Jack D. Kingsley, and Jerome S. Prener, both of Schenectady, N.Y., assignors to General Electric Company

Filed July 22, 1969, Ser. No. 843,401
Int. Cl. C09k *1/12;* B44d *5/00*
U.S. Cl. 117—100 B 5 Claims



A method is disclosed for making multi-component phosphor structures whose emission color depends on the energy of the electrons used to excite them. The method comprises the mixing of two or more component phosphors, each component phosphor having particles with non-luminescent interior core regions and non-luminescent exterior surface regions separated by a luminescent region, the region dimensions and emission color of each component being distinct. These structures are formed by diffusing activating and/or coactivating impurities partially into the particles, or by growth of activated material on the outside of non-luminescent material, and by the subsequent diffusion of luminescence killing impurities partially into the luminescent region.

3,664,863

CARPETS HAVING A BACK-COATING OF IN SITU-FORMED POLYURETHANE

Willem Dijkhuizen, Zuid-Laren, and Pieter Johannes Adrianus Beersma, Haren, both of Netherlands, assignors to Scholten Research N.V., Foxhol, Netherlands

Filed May 19, 1969, Ser. No. 825,959
Claims priority, application Great Britain, May 25, 1968, 25,096/68
Int. Cl. B44d *1/09;* D04h *1/58*
U.S. Cl. 117—161 KP 11 Claims

Carpets are back-coated with essentially non-cellular elastomeric polyurethanes, formed and cured in situ at ambient temperature from a mixture of selected polyether-polyols, selected polyisocyanates and catalyst.

3,664,864

DURABLY SHAPING KERATINOUS FIBROUS MATERIALS

Rudi Widder, Eppelheim; Harry Distler, Ludwigshafen, and Erwin Haug, Gruenstadt, all of Germany, assignors to Badische Anilin-& Soda-Fabrik Aktiengesellschaft, Ludwigshafen/Rhine, Germany

Filed July 28, 1969, Ser. No. 845,508
Claims priority, application Germany, July 27, 1968, P 17 69 865.6
Int. Cl. B44d *1/48;* D06n *13/36*
U.S. Cl. 117—119.8 12 Claims

Durable shaping of keratinous fibrous materials by impregnation with solutions or dispersions of compounds which in the betaine form have the formula $R^1R^4R^5N$ —CHR^2—CHR^3—O-SO_2 wherein R^1 is an unsubstituted or substituted hydrocarbon radical, R^2 and R^3 each denotes a hydrogen atom or a lower alkyl radical, and R^4 and R^5 each denotes a hydrogen atom or an unsubstituted or substituted hydrocarbon radical and heating with steam at 100° to 150° C while shaping; fibrous materials thus treated.

3,664,865

GRAPHITE IMPREGNATED WITH BISMUTH-NICKEL ALLOY

Franco Lanza, Varese, and Giuseppe Marengo, Angera, both of Italy, assignors to European Atomic Energy Community (Euratom), Kirchberg, Luxembourg

Filed Dec. 1, 1969, Ser. No. 881,337
Claims priority, application Netherlands, Dec. 13, 1968, 6817923
Int. Cl. C23c *1/10*
U.S. Cl. 117—160 R 5 Claims

Metal-impregnated graphite is characterized in that the metal consists of an alloy of bismuth and nickel.

3,664,866

COMPOSITE, METHOD FOR GROWTH OF IIB—VIA COMPOUNDS ON SUBSTRATES, AND PROCESS FOR MAKING COMPOSITION FOR THE COMPOUNDS

Harold M. Manasevit, Anaheim, Calif., assignor to North American Rockwell Corporation

Filed Apr. 8, 1970, Ser. No. 26,574
Int. Cl. B44d *1/18*
U.S. Cl. 117—201 14 Claims

A composite comprises a substrate of monocrystalline structure which is either a hexagonal, cubic, rhombohedral or orthorhombic, and a monocrystalline layer on the sub-

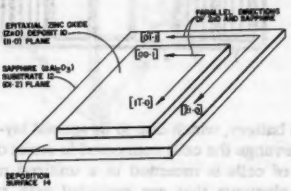
strate of a JQ compound formulation wherein J is at least one element selected from the group consisting of cadmium, zinc and mercury, and wherein Q is at least one element selected from the group consisting of sulfur, tellurium, selenium and/or oxygen. An alkyl or hydride type dopant may be used to provide a homogeneously doped layer. Processes for making the layer composition and for making the composite are described.

3,664,867

COMPOSITE STRUCTURE OF ZINC OXIDE DEPOSITED EPITAXIALLY ON SAPPHIRE

Guido Galli, Saratoga, and Jesse E. Coker, Orange, both of Calif., assignors to North American Rockwell Corporation

Filed Nov. 24, 1969, Ser. No. 879,470
Int. Cl. B44d *1/02, 1/18*
U.S. Cl. 117—201 **12 Claims**



Composite heteroepitaxial structures of single crystal zinc oxide epitaxially deposited in a layer on a single crystal substrate of alpha-aluminum oxide (sapphire) and process for producing desired orientations of the zinc oxide single crystal layer corresponding to the orientation of the sapphire substrate surface.

3,664,868

GOLD METALLIZING OF REFRACTORY METALS ON CERAMIC SUBSTRATES

M. Paul Davis, Hixson, and Paul R. Theobald, Chattanooga, both of Tenn., assignors to American Lava Corporation, Chattanooga, Tenn.

Filed Mar. 16, 1970, Ser. No. 20,112
Int. Cl. H05k *3/10*
U.S. Cl. 117—212 **5 Claims**

Substrates having patterns of refractory metals, such as tungsten, molybdenum or molybdenum-manganese, are clad with gold which is congruent to the refractory metal pattern by screen-printing a gold ink essentially free from other inorganic constituents over the refractory metal pattern and then firing to a temperature above the melting point of gold. Exactly congruent gold layers having a smooth fire-polished surface are thus obtained. The method is equally applicable to terminals which are readily accessible to barrel plating and to terminals which are inaccessible to normal barrel plating procedures.

3,664,869

TYPEWRITER RIBBONS HAVING CORRECTION COATING AND METHOD OF MAKING

Sergio Sala; Ambrogio Cuneo, both of Via Durini, 7, Milan, Italy, and Wolfgang Dabisch, Groos Strasse, 11 Eltville am Rhine, Germany

Filed Jan. 23, 1969, Ser. No. 793,276
Claims priority, application Italy, Jan. 24, 1968, 11935 A/68
Int. Cl. B41m *5/10*
U.S. Cl. 117—2 TC **21 Claims**

The invention provides typewriting ribbons which comprise on a single, homogeneous support consisting of a synthetic polymer film a writing, inked part and a part suitable for correcting typing mistakes coated with a white, hiding composition. The support, preferably made of a polyester resin or of polypropylene, is preferably coated with a thin layer essentially consisting of a vinylidenic polymer. The hiding composition for correction contains essentially 75–98 percent b.w. of a pigment which is titanium bioxide having an oil index of between 30 and 60, 0.5–10 percent b.w. of a binder which is a rubber-like resin having a molecular weight over 2,000 and soluble in organic solvents, little percentages of a wetting agent.

3,664,870

REMOVAL AND SEPARATION OF METALLIC OXIDE SCALE

Alfred W. Oberhofer, Alsip; Donald R. Anderson, Oswego, and Charles C. Payne, Chicago, all of Ill., assignors to Nalco Chemical Company, Chicago, Ill.

Filed Oct. 29, 1969, Ser. No. 872,411
Int. Cl. C23g *1/02, 1/36*
U.S. Cl. 134—3 **5 Claims**

A method of removing metallic oxide scale from the cooling system of a nuclear reactor is disclosed. By forming complexes of the metals using ammoniated citric acid, the scale can be removed. By selectively adsorbing these complexes on ion exchange resins the scale can be separated.

3,664,871

COATING REMOVAL METHOD

Eugene M. Fauber, Hammond, Ind., assignor to Atlantic Richfield Company, New York, N.Y.

Filed Mar. 30, 1970, Ser. No. 23,978
Int. Cl. B08b *3/08, 3/10*
U.S. Cl. 134—6 **10 Claims**

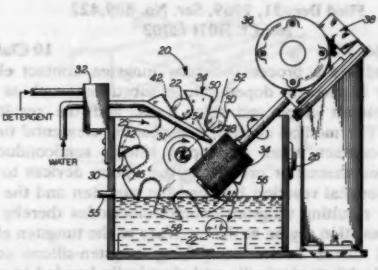
A method of removing solid surface materials from a solid substrate which comprises applying to the surface materials, preferably as a mixture, water and a relatively volatile, heavier-than-water, water-immiscible solvent for the surface material, preferably in a volumetric ratio of about one part water per part solvent. Water forms an overlying layer above the solvent such that the solvent softens the surface material and there is little solvent loss by vaporization. Subsequently the surface material can be removed by conventional means from a foundation or solid substrate left fit for resurfacing. A preferred solvent is carbon tetrachloride.

3,664,872

METHOD FOR SCRUBBING THIN, FRAGILE SLICES OF MATERIAL

Gerard A. Frank, Allentown; Karl F. Kipp, Nazareth, and Donald R. Oswald, Schnecksville, all of Pa., assignors to Western Electric Company, Incorporated, New York, N.Y., by said Frank and said Kipp and Bell Telephone Laboratories, Incorporated, Murray Hill, N.J., by said Oswald

Filed Sept. 18, 1970, Ser. No. 73,473
Int. Cl. B08b *7/00*
U.S. Cl. 134—6 **5 Claims**



Simultaneously, both sides of a thin, fragile slice of brittle material, such as single-crystal silicon, are scrubbed. The slices are loaded, one at a time, into a rotatable disc having

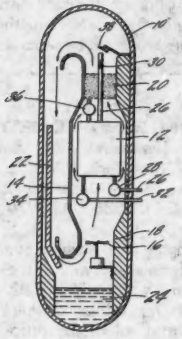
pockets formed in the periphery thereof. The disc conveys the slices between two opposed counter-rotatable brushes within a detergent spray. After passing the rotatable brushes, the slices drop from the disc and float through the detergent bath to a container positioned below the disc.

3,664,873

SELF-REGULATING ENCAPSULATED FUEL CELL SYSTEM

Richard F. Buswell, Glastonbury; Peter G. Nicholas, South Windsor, and William J. Olsson, Glastonbury, all of Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Apr. 21, 1969, Ser. No. 817,698
Int. Cl. H01m 27/14
U.S. Cl. 136—86 C 6 Claims



A hydrogen and oxygen fuel cell powerplant is disclosed wherein the fuel cell is encapsulated within a sealed pressure tank for undersea applications. The system is self-regulating to compensate for variations in the venting and leaking of reactant gases. Hydrogen gas in the capsule is reacted or burned, and the resulting water vapor is condensed and collected in a tank at the bottom of the capsule. A simple method of controlling the reactant purge flow has been devised to include essentially a pressure regulator in the oxygen purge line and an orifice in the hydrogen purge line.

3,664,874

TUNGSTEN CONTACTS ON SILICON SUBSTRATES

Joseph Epstein, Baltimore, Md., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Dec. 31, 1969, Ser. No. 889,422
Int. Cl. H01l 15/02
U.S. Cl. 136—89 10 Claims

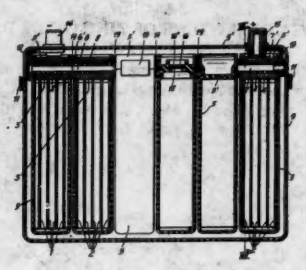
Disclosed are a process whereby tungsten contact electrodes are formed on doped silicon substrates, such as integrated circuit chips and solar cells, and the resultant products. The method comprises depositing elemental tungsten on contact areas of doped silicon semiconductor devices, and thereafter processing the silicon devices to induce a chemical reaction between the tungsten and the silicon. The resulting tungsten contact electrodes thereby include a transition region at the interface of the tungsten electrode and silicon device comprising tungsten-silicon compounds which are physically and chemically bonded to, and form an integral part of, both the tungsten electrode material and the silicon semiconductor material. A lead is bonded directly to the tungsten electrode.

3,664,875

STORAGE BATTERY

Armin Graf, Lettenstrasse 32, 9500 Wil, Switzerland

Filed Dec. 23, 1969, Ser. No. 887,656
Claims priority, application Switzerland, Aug. 29, 1969, 13,299/69
Int. Cl. H01m 5/00, 1/06
U.S. Cl. 136—134 R 7 Claims



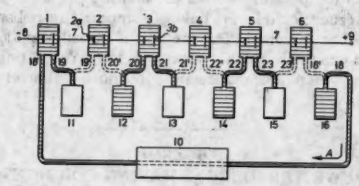
A storage battery, which due to its special lay-out makes it possible to arrange the cells connected in series or in parallel. A package of cells is mounted in a unitized manner upon connecting elements that are provided with polar bridges which simultaneously serve as holding devices for the electrodes. An extremely compact assembly is possible as the length of the storage batteries is shortened, a fact that is of importance in smaller motor cars, where the room available is scarce. In comparison to conventional storage batteries the weight is lower, the leaden bridges are shorter, so that less material are needed, by which the electrical resistance is also reduced.

3,664,876

BATTERY

Heinz Carl, Masenwinkel, Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt, Germany

Filed May 20, 1970, Ser. No. 38,920
Claims priority, application Germany, May 21, 1969, P 19 25 861.8
Int. Cl. H01m 45/00
U.S. Cl. 136—160 4 Claims



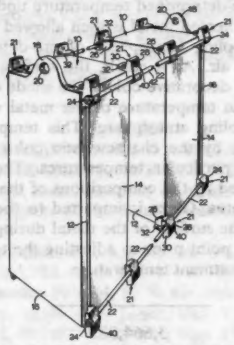
The cells of an electrochemical battery are connected electrically in series and interconnected serially for the circulation of electrolyte from cell to cell. Check valves of electrically insulating material are provided for breaking the electrolyte paths between the individual cells. In the method, the electrolyte is circulated first through every other cell while the path of electrolyte into and out of intermediate cells is broken. Then electrolyte is circulated through the intermediate cells while the electrolyte paths into and out of the "every other" cells are broken.

3,664,877

BATTERY OF CELLS AND MEANS OF ASSEMBLY

Frank Donald Shaw, c/o 143 Bermondsey Rd., Toronto 16, Ontario, Canada

Filed May 28, 1970, Ser. No. 41,240
Int. Cl. H01m 1/04
U.S. Cl. 136—171 8 Claims



An assembly of cells is formed of insulating spacers, one between each adjacent pair of cells, each spacer having a portion bearing against side walls of a pair of adjacent cells and additional portions bearing respectively against the adjacent corners of the side and front walls; each spacer has a channel outward of the cells which channel is parallel to the front walls thereof and the line of spacers are held together in compression by a threaded tie-rod and cooperating end plates.

3,664,878

PRESSURE RELIEF VENT VALVE FOR A FLUID TIGHT SEALED CONTAINER ESPECIALLY AN ALKALINE GALVANIC CELL

Helmut K. Amthor, Rocky River, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Filed Aug. 27, 1969, Ser. No. 853,279
Int. Cl. H01m 1/06
U.S. Cl. 136—178 19 Claims

A pressure relief vent valve for a fluid-tight sealed container and especially a sealed alkaline galvanic cell, the pressure relief vent valve comprising a resilient deformable ball of an elastomeric material which is positioned to overlie a vent orifice provided within the container and a retainer means for maintaining the ball in place over the vent orifice and in contact with a valve seat provided around the peripheral edge portions of the vent orifice and for compressing and deforming the ball into a flattened configuration forming a normally fluid-tight seal between the ball and the valve seat.

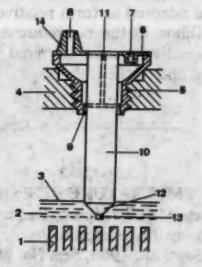
3,664,879

VENT PLUG FOR A FILLING OPENING OF A CELL OF AN ELECTRIC STORAGE BATTERY

Bertil Lennart Olsson, Hallstorpsvagen 6, 212 32 Malmo, Sweden

Filed Aug. 24, 1970, Ser. No. 66,495
Claims priority, application Sweden, Sept. 12, 1969, 12,556/69
Int. Cl. H01m 7/00, 45/06
U.S. Cl. 136—182 1 Claim

A vent plug for an automobile type battery is provided with both a means to add electrolyte without removing the plug and a light transmitting rod that is immersed in the electrolyte to show the proper level without removing the vent plug as the filling progresses.

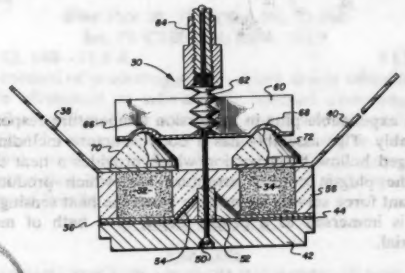


3,664,880

MECHANICAL MOUNTING FOR A THERMOELECTRIC COUPLE

Norman C. Miller, Woodland Hills, Calif., assignor to North American Rockwell Corporation

Filed Apr. 14, 1969, Ser. No. 815,789
Int. Cl. H01v 1/02
U.S. Cl. 136—205 6 Claims



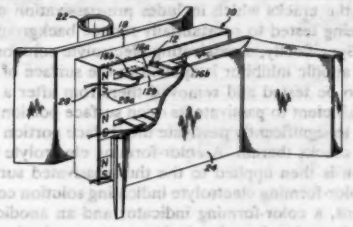
An improved mechanical mounting that places the thermoelectric elements of a thermoelectric couple under compressive loading to ensure good electric and thermal contact.

3,664,881

THERMOMAGNETIC DEVICE

Wesley Love, 2472 Observatory Road, Cincinnati, Ohio

Filed Aug. 26, 1969, Ser. No. 853,079
Int. Cl. H01v 3/00
U.S. Cl. 136—205 12 Claims



A thermomagnetic device for generating voltage from heat comprising at least one thin bifurcated ribbon of a thermoelectrically active neutral element or alloy material, the bifurcation therein being positioned substantially centrally on

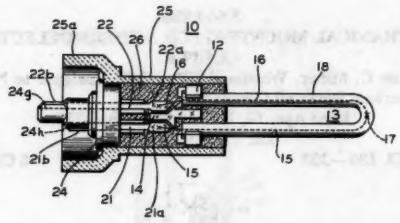
the ribbon, magnet means having a field which is at substantially right angles to the ribbon at the bifurcation, heat and cold source means adapted to form relatively warm and cold portions on the ribbon at the nonbifurcated and bifurcated ends thereof, respectively, and terminal means associated with the bifurcated end of the ribbon.

3,664,882

IMMERSION TEMPERATURE RESPONSIVE DEVICE

Richard James Hance, Philadelphia, Pa., assignor to Leeds & Northrup Company, Philadelphia, Pa.

Filed Sept. 24, 1969, Ser. No. 860,518
Int. Cl. H01v *1/02*
U.S. Cl. 136—234 1 Claim



An expendable plug-in immersion temperature responsive assembly. This assembly has a body structure including an enlarged hollow body portion which provides a heat shield for the plug-in contact structure and which produces a buoyant force serving to indicate when the heat sensing portion is immersed to a proper depth in a bath of molten material.

3,664,883

PRE-PASSIVATION-ANODIC INHIBITOR-COLOR METHOD FOR DETECTING CRACKS IN METAL BODIES

Michael F. Henry, Schenectady, N.Y., assignor to General Electric Company

Filed Dec. 31, 1969, Ser. No. 889,693
Int. Cl. C23f *9/00*; G01n *31/22*
U.S. Cl. 148—6.2 12 Claims

A non-destructive color method for detecting cracks in a metal body by selective corrosion of the surface portion within the cracks which includes pre-passivation of the surface being tested to substantially reduce background indications. Specifically, a passivating electrolyte solution containing an anodic inhibitor is applied to the surface of the metal body to be tested and removed therefrom after a period of time sufficient to passivate its open surface portion but insufficient to significantly passivate the surface portion contained within cracks therein. A color-forming electrolyte indicating solution is then applied to the thus-passivated surface area. The color-forming electrolyte indicating solution contains halide ions, a color-forming indicator and an anodic inhibitor and is formulated so that it does not corrode the open surface portion of the metal body but is sufficiently reactive to corrode the surface portion within cracks therein resulting in the formation of metallic ions. The color-forming indicator is of the type which reacts with the thus formed metal ions to form a distinctive colored compound at the crack locations.

3,664,884

METHOD OF COLORING METALS BY THE APPLICATION OF HEAT

Lee D. Underwood, Salt Lake City, Utah, assignor to Concept Research Corporation, Salt Lake City, Utah

Filed Mar. 11, 1968, Ser. No. 711,846
Int. Cl. C23f *7/02*
U.S. Cl. 148—6.3 7 Claims

A metallic composition, such as titanium or stainless steel, is heated to a pre-determined temperature under a shielding atmosphere. The heated metal is then allowed to cool in the presence of a cooling atmosphere of pre-determined composition, notably air. As a result, the surface of the metal acquires a stable, decorative color. The shade of the color is determined by the temperature of the metal when it is exposed to the cooling atmosphere. This temperature is indicated indirectly by the characteristic color of the metal being treated at particular temperatures. The tone of the color is determined by the compositions of the shielding and cooling atmospheres. Glaze is imparted to the colored surface by heating the surface of the metal during treatment to above its melting point prior to adjusting the temperature of the metal to its treatment temperature.

3,664,885

METHOD FOR PROTECTION OF EVAPORATOR HEATING ELEMENTS FROM CORROSION

Frida Abramovna Orlova, Leninsky prospekt, 41, kv. 334, Moscow; Georgy Vasilievich Seleznev, ulitsa Mayakovskogo, 10, kv. 10, and Petr Veniaminovich Bonjuk, prospekt 40 let Oktyabrya, 2, kv. 5, both of Dzerzhinsk, all of U.S.S.R.

Filed May 7, 1970, Ser. No. 35,564
Int. Cl. C23f *11/06*
U.S. Cl. 148—6.14 4 Claims

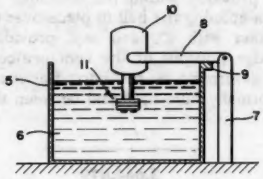
The corrosion of heating elements in evaporators for alkaline media is substantially prevented by using chromium steel containing preferably 25–28 percent chromium as the metal for the heating elements in the presence of 0.05 to 1g/l of sodium chlorate.

3,664,886

METHOD FOR RUNNING IN METAL COMPONENTS

Kristian Stausholm Pedersen, Nordborg, Denmark, assignor to Danfoss A/S,, Nordborg, Denmark

Filed Feb. 2, 1970, Ser. No. 7,967
Claims priority, application Germany, Feb. 28, 1969, P 19 10 146.3
Int. Cl. C23f *7/08*
U.S. Cl. 148—6.15 R 1 Claim



The invention relates to a method for running in metal components which move over, or mesh with each other, and to apparatus for performing the method. Parts are manufactured with normal tolerances and then are run together in a bath of material such as manganese phosphate. The phosphate material adheres to the parts as a solid coating which fills in low surface portions on the parts and is rubbed away, along with some metal, from the higher surface portions of the parts.

3,664,887

PROCESS FOR INCREASING CORROSION RESISTANCE OF CONVERSION COATED METAL

Thomas Clifford Atkiss, Pottstown, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Apr. 14, 1969, Ser. No. 816,036
Int. Cl. C23f 17/00
U.S. Cl. 148—6.16 2 Claims

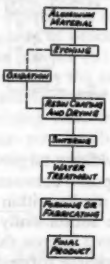
The corrosion resistance of conversion coated metal is increased by a process which comprises the steps of applying a phosphate conversion coating, rinsing with water, applying a chromate rinse, drying the metal surface, rinsing with deionized water, and drying.

3,664,888

METHOD OF RESIN COATING A METAL AND RESIN-COATED METAL PRODUCT THEREOF

Toshisaburo Oga, Kobe, and Ken Okazaki, Amagasaki, both of Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Original application Oct. 4, 1966, Ser. No. 584,223, now Patent No. 3,563,785, dated Feb. 16, 1971. Divided and this application Feb. 24, 1970, Ser. No. 13,451
Claims priority, application Japan, Oct. 9, 1965, 40/61681; Nov. 27, 1965, 40/72577; 40/72578; Sept. 17, 1966, 41/61596; Sept. 22, 1966, 41/62764
Int. Cl. B44d 1/092
U.S. Cl. 148—6.27 10 Claims



The method of coating an aluminum or aluminum alloy surface with a resin wherein the surface is anodically etched in a halide solution to provide minute surface irregularities and cavities to adequately anchor the resin to be applied. The etched surface may be oxidized to provide greater anchorage and may also be heat treated with hot water or steam either prior or subsequent to resin coating to further enhance the resin bondage and service life.

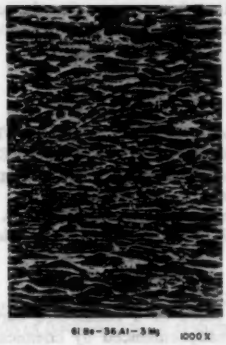
3,664,889

TERNARY, QUATERNARY AND MORE COMPLEX ALLOYS OF BE-AL

William H. McCarthy, Los Altos; Raymond W. Fenn, Jr., Los Altos Hills, and Donald D. Crooks, San Jose, all of Calif., assignors to Lockheed Aircraft Corporation, Burbank, Calif.

Filed May 26, 1969, Ser. No. 827,752
Int. Cl. C22f 1/04
U.S. Cl. 148—11.5 R 24 Claims

An alloy having extraordinarily high modulus to density and tensile strength to density ratios along with good workability and elongation properties is made from a beryllium-aluminum alloy powder having a complexity index between 1 and 5, as defined in U. S. Pat. No. 3,337,334. Magnesium or zinc or copper or one or more of several metals is blended with or deposited on the Be-Al powder; then the blend is consolidated without melting it and then worked, diffused, and heat-treated, all below the eutectic temperature. The result is that the magnesium or other component (or components) of the alloy is dissolved substantially only into the aluminum-rich phase while leaving the complexity index unchanged. Hence, the properties are superior to alloys having the same Be-Al composition with or without other in-



gredients, especially those in which the magnesium or other metal is melted into the Be-Al composition.

3,664,890

METHOD OF PRODUCING A DEEP DRAWN COMPOSITE ARTICLE

Joseph Winter, New Haven, Conn., assignor to Olin Corporation

Filed Feb. 20, 1970, Ser. No. 13,165
Int. Cl. C22f 1/04; B32b 15/20
U.S. Cl. 148—11.5 A 7 Claims

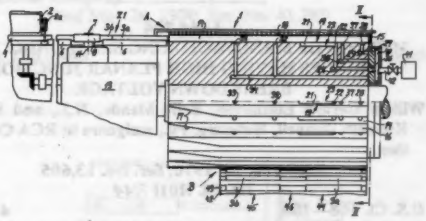
A method of producing a deep drawn article wherein earing is eliminated or substantially lessened comprising integrally bonding a first metallic component having characteristic 45° earing propensity after deep drawing to a second metallic component having characteristic 90° earing propensity after deep drawing, and deep drawing, and the article produced thereby.

3,664,891

APPARATUS FOR ASSEMBLING ROWS OF ROD-SHAPED ARTICLES

Bernhard Schubert, Hamburg; Alfred Schubert, Neuboernsen, and Herbert Berlin, Hamburg, all of Germany, assignors to Hauni-Werke Korber & Co., KG., Hamburg, Germany

Filed Mar. 11, 1970, Ser. No. 18,555
Claims priority, application Germany, Mar. 13, 1971, P 19 12 652.4
Int. Cl. B65g 46/26
U.S. Cl. 198—31 AA 23 Claims



Apparatus for converting a single file of cigarette rod sections or like articles into two rows of parallel articles which move sideways comprises a pair of accelerating cams which engage alternate articles of the file and propel them, together with the preceding articles, into successive flutes of a continuously moving row forming drum. The latter is provided

with pneumatic braking means which arrests the pairs of articles in their flutes and with one or two pneumatic displacing units which move the front articles lengthwise away from the rear articles and/or vice versa so that the articles form two rows whose articles are transferred into successive flutes of a receiving drum.

3,664,892

PERMANENT MAGNET MATERIAL POWDERS HAVING SUPERIOR MAGNETIC CHARACTERISTICS

Joseph J. Becker, Schenectady, N.Y., assignor to General Electric Company

Original application Jan. 31, 1968, Ser. No. 701,840, now Patent No. 3,558,372. Divided and this application Sept. 17, 1970, Ser. No. 73,195

Int. Cl. H01f 1/06

U.S. Cl. 148—31.57 8 Claims

The coercive force of a cobalt-rare earth intermetallic compound is greatly enhanced by chemically treating the compound in finely divided form so as to smooth the surfaces of the individual particles.

3,664,893

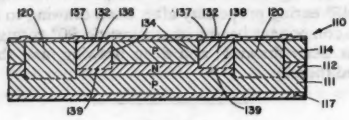
FABRICATION OF FOUR-LAYER SWITCH WITH CONTROLLED BREAKOVER VOLTAGE

Orville Phillip Frazee, Phoenix, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.

Continuation of application Ser. No. 405,993, Oct. 23, 1964, now abandoned. This application Dec. 9, 1968, Ser. No. 785,026

Int. Cl. H01l 7/36, 3/00, 11/14

U.S. Cl. 148—175 1 Claim



In a four layer switching device, either as a discrete device or as an integrated circuit which may be part of a memory device, a method is disclosed for reliably and consistently controlling the breakover voltage of the control junction during manufacture by diffusing an impurity into the surface of a layer of the opposite conductivity type semiconductor material to form such junction and continuing such diffusing until a solid state solubility concentration of said impurity in the material of said layer, at a predetermined temperature, is reached at the surface of such layer.

3,664,894

METHOD OF MANUFACTURING SEMICONDUCTOR DEVICES HAVING HIGH PLANAR JUNCTION BREAKDOWN VOLTAGE

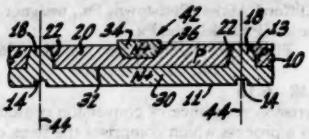
Willem Gerard Einthoven, Belle Meade, N.J., and Howard Kenneth Donnell, Holicong, Pa., assignors to RCA Corporation

Filed Feb. 24, 1970, Ser. No. 13,605

Int. Cl. H01l 7/44

U.S. Cl. 148—186 4 Claims

A body of semiconductor material having first and second opposed faces, and containing a region of N type conductivity and a region of P type conductivity separated by a P-N junction. The N type region contains a central portion extending inward from one face partially through the body toward the second face, and a peripheral portion extending completely through the body with its resistivity increasing toward the second face relative to the remainder of the N type region adjacent the P-N junction. The peripheral portion encloses the P type region and extends the P-N junction



to the second face where it has the least chance for voltage breakdown.

3,664,895

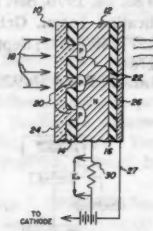
METHOD OF FORMING A CAMERA TUBE DIODE ARRAY TARGET BY MASKING AND DIFFUSION

Donald L. Schaefer, and Ronald H. Wilson, both of Schenectady, N.Y., assignors to General Electric Company

Filed June 13, 1969, Ser. No. 833,111

Int. Cl. H01l 7/44

U.S. Cl. 148—187 6 Claims



Silicon diode array vidicon targets characterized by a silicon oxide insulator disposed between P-type conductivity regions forming discrete diodes within an N-type conductivity wafer have been made substantially immune to burn-in by the utilization of a 0,1 to 3 micron thick electrically conducting glass layer to leak charge formed on the insulator to the adjacent P-type conductivity regions of the target. Preferably the electronically conducting glass is an alkaline earth metal borate glass containing an oxide of a metal, e.g., iron, vanadium, cobalt, etc., providing ions of both a higher valence state and a lower valence state within the glass to permit regulation of the resistivity of the glass layer during fabrication of the bulk glass. To inhibit crazing of the glass layer while providing superior contact between the glass and the surface of the target, the glass layer is R.F. sputter deposited atop the target employing a sputtering atmosphere, e.g., argon, nitrogen, oxygen, selected to provide the desired resistivity in the deposited glass layer.

3,664,896

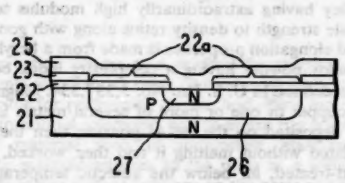
DEPOSITED SILICON DIFFUSION SOURCES

David M. Duncan, 403 Roosevelt Way, San Francisco, Calif.

Filed July 28, 1969, Ser. No. 845,373

Int. Cl. H01l 7/44

U.S. Cl. 148—187 3 Claims



Non-single crystal semiconductor material formed on a semiconductor substrate and separated from all but a portion

of the substrate by an intervening insulation layer contains at least one dopant and preferably two dopants of opposite conductivity type. Heating the substrate, together with the overlying insulation and non-single crystal semiconductor layers, drives the dopants contained in the non-single crystal semiconductor material into the underlying semiconductor substrate in such a manner as to form diodes or transistors.

3,664,897

SLURRY EXPLOSIVE COMPRISING AMMONIUM NITRATE AND ALUMINUM POWDER

Yoshikazu Wakazono, Zushi-shi; Terushige Ogawa, Yokohama-shi, and Yoshiyasu Otsuka, Niihama-shi, all of Japan, assignors to Sumitomo Chemical Co., Ltd., Higashiki, Osaka

Filed Oct. 24, 1969, Ser. No. 869,324
Claims priority, application Japan, Oct. 31, 1968, 43/79809
Int. Cl. C06b *1/04*
U.S. Cl. 149—38 12 Claims

A slurry explosive containing, as the main ingredients, (1) 40 to 80 percent by weight of ammonium nitrate or a mixture of ammonium nitrate and an alkali metal nitrate or a mixture of ammonium nitrate and an alkaline earth metal nitrate or a mixture of ammonium nitrate, an alkali metal nitrate and an alkaline earth metal nitrate, (2) 5 to 20 percent by weight of aluminum powder consisting of aluminum powder (a) which is manufactured by the ball milling method or the stamping method, and the particle size of which is 30 mesh (JIS sieve) or below; and aluminum powder (b) having no leafing property which is manufactured by the atomizing method or the graining method, the particle size of which is 30 mesh (JIS sieve) or below, the mixing ratio by weight of aluminum powder (a) and aluminum powder (b) being 50 to 20: 50 to 80, and (3) 5 to 25 percent by weight of water.

3,664,898

PYROTECHNIC COMPOSITION

Francis R. Taylor, Mt. Arlington; Patricia J. Leader, Rockaway, and Raymond P. Westerdahl, Denville, all of N.J., assignors to The United States of America as represented by the Secretary of the Army

Filed Aug. 4, 1969, Ser. No. 847,389
Int. Cl. C06b *15/00*
U.S. Cl. 149—41 31 Claims

The addition of transition metals or oxides or salts thereof, to pyrotechnic compositions containing conventional fuels and oxidizers, to greatly improve the luminous efficiency, average luminous output and propagative burning characteristics of such pyrotechnic compositions. The elements and compounds which are added also reduce the burning rate and lower the ignition temperature of such pyrotechnic compositions.

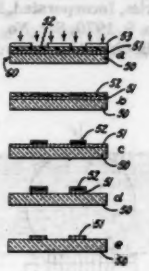
3,664,899

REMOVAL OF ORGANIC POLYMERIC FILMS FROM A SUBSTRATE

Archibald N. Wright, Schenectady, and Richard C. Merrill, Glens Falls, both of N.Y., assignors to General Electric Company

Continuation-in-part of application Ser. No. 731,090, May 29, 1968. This application Dec. 29, 1969, Ser. No. 888,380
Int. Cl. B29c *17/08*; C23b *3/04*
U.S. Cl. 156—8 11 Claims

A solvent free method for removing thin organic polymeric film from a substrate is provided utilizing ultraviolet light at wavelengths below 3,500 Angstroms. The method also can be employed to effect the direct configurational removal of organic polymeric film from etchable substrates to provide for the fabrication of microelectronic circuits.

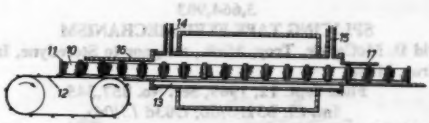


3,664,900

METHOD OF TREATING A LENGTH OF MATERIAL

Kenneth Cuckson, Derby, and Gerald W. Chapman, Ockbrook, both of England, assignors to Rolls-Royce Limited, Derbyshire, England

Filed May 1, 1969, Ser. No. 820,973
Int. Cl. C01b *31/07*; B65h *81/00*
U.S. Cl. 156—174 5 Claims



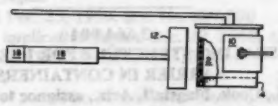
A method of treating a length of material comprising winding the material onto a plurality of flanged bobbins, disposing the bobbins coaxially end to end in a line, and passing the line of flanged bobbins into, through, and out of a treatment chamber, the treatment chamber having inlet and outlet conduits through which the bobbins pass and to which the flanges of bobbins are substantially sealed throughout their passage therethrough.

3,664,901

APPARATUS FOR SEALING PAPERBOARD CONTAINERS

Jerry W. Young, Kansas City, Mo., assignor to Phillips Petroleum Company

Filed May 28, 1970, Ser. No. 41,289
Int. Cl. B65b *65/02*
U.S. Cl. 156—443 2 Claims



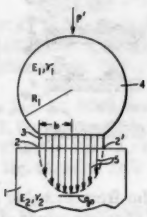
A method and apparatus for installing a paperboard blank on a downwardly hanging mandrel of a turret-type container forming machine.

3,664,902

NONUNIFORM PRESSURE BONDING METHOD

Emmanuel P. Papadakis, Acton, Mass., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 9, 1970, Ser. No. 1,711
Int. Cl. B30b 15/34; B32b 31/20
U.S. Cl. 156—580 7 Claims



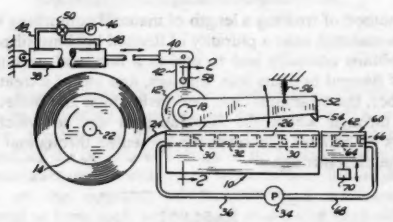
A method is described which utilizes an elastic body of curved surface area to bond large area slabs to substrates. The bonding agent is applied to the interface between the slab and substrate and enough pressure is applied to the complaint body to flatten it out over the entire area of the slab. A pressure gradient will result along the interface which will force the bonding agent to flow toward the edges of the slab. An extremely thin, highly uniform bond is therefore achieved.

3,664,903

SPLICING TAPE FEED MECHANISM

David D. McCorkle, Troy, Mich., assignor to Steredyne, Inc., Troy, Mich.

Filed Sept. 12, 1969, Ser. No. 857,345
Int. Cl. B31f 5/06; G03d 15/04
U.S. Cl. 156—506 3 Claims



A device for feeding splicing tape from a roll and cutting it to length comprises a vacuum-assisted V-grooved guide slot along which the tape is pressed and driven by a similarly shaped drive roller. The groove produces a longitudinal crease in the tape which prevents the tape from rewinding. A cutter arm is actuated by the same power source as the drive roller to cut the tape to predetermined lengths during the intervals between the incremental tape advancement along the groove.

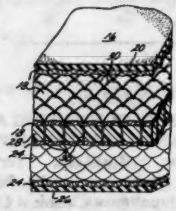
3,664,904

SELF-SEALING STRUCTURE FOR USE AS A FLUID BARRIER IN CONTAINERS

Richard L. Cook, Flagstaff, Ariz., assignor to Marshall Industries, San Marino, Calif.

Filed Mar. 4, 1970, Ser. No. 16,471
Int. Cl. B32b 3/06; B65d 37/00
U.S. Cl. 161—50 23 Claims

A self-sealing structure adapted for use in a container or the like as a fluid barrier. The structure comprises sealant material adapted to swell in the presence of certain fluids and is interposed between inner and outer layers, at least one of the layers being resiliently expansible to accommodate such swelling. Tension means extending between the layers limit the amount of expansion. In one embodiment the inner layer is pervious to the contained fluid, and the contained fluid is one which swells the sealant material. The swelled sealant material and the resilient layer or layers develop an internal pressure which tends to urge the sealant material toward any puncture of the structure. In another embodiment, the sealant material is caused to swell by exposure thereof to a swelling agent other than the contained fluid.



3,664,905

NON-WOVEN NEEDLED FIBROUS STRUCTURE

Wilhelm August Schuster, Frankfurt/Main, Germany, assignor to Filztuchverwaltungs-Gesellschaft mit, Frankfurt/Main, Germany

Continuation-in-part of application Ser. No. 512,407, Dec. 8, 1965, now abandoned. This application Aug. 27, 1969, Ser. No. 853,362
Claims priority, application Germany, Feb. 17, 1965, F 45271
Int. Cl. B32b 5/06, 5/12, 31/22
U.S. Cl. 161—59 8 Claims

A method of making a web suitable for use as papermakers' felt including superposing a plurality of fibrous batts such that substantially parallel fibers in one batt extend in transverse direction to substantially parallel fibers in an adjacent batt, needling the superposed batts to form a laminated web, stretching the web to tension the fibers, applying a coating of adhesive to the surface of at least one side of the web, compressing the web, and subjecting the web to a jet of compressed air to break coherent films of the adhesive into globules leaving a portion of the adhesive adhered at points of contact and intersection of fibers on the surface of the web and driving the remaining globules into the web to adhere at points of contact of individual fibers near said surface.

3,664,906

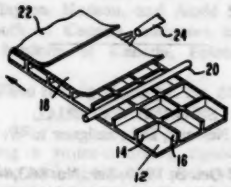
STRUCTURAL PANEL OF RIBBED STRUCTURES OF THERMOPLASTIC RESIN

Martval J. Hartig, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 26, 1970, Ser. No. 10,697
Int. Cl. B32b 3/12
U.S. Cl. 161—68 3 Claims

Molten thermoplastic resin, e.g., polyethylene, is forced into a pattern on the surface of a rotating roll to form a web

of ribs usually integrally molded to a continuous film; this



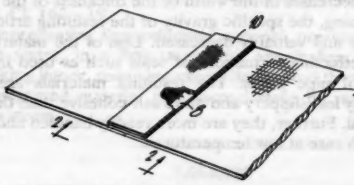
web is of low density and has a high strength-to-weight ratio so as to be used for structural purposes and packaging.

3,664,907

INDUSTRIAL CONVEYOR BELTS

Kenneth R. Price, Albany, N.Y., assignor to Huyck Corporation, Rensselaer, N.Y.

Filed Feb. 2, 1970, Ser. No. 7,661
Int. Cl. B32b *3/06, 3/10, 27/38*
U.S. Cl. 161—89 14 Claims



This invention relates to bonds, and processes for making same, which are useful in the manufacture, joining, and repair of industrial conveyor belts, and endless cloth used in paper manufacturing machinery, and, more particularly, to a structurally integrated, yet pervious, laminated structure comprising a first layer intermediate and continuously bonded to second and third layers. The resultant porous laminate manufactured in accordance with the teachings of the present invention may be used in various applications related to industrial conveyor belts or papermakers clothing. For example, it may be employed to form a seam for or a patch in papermakers fabrics useful in the forming section of the typical fourdrinier papermaking machine.

3,664,908

METHOD OF MAKING MOLDED LAMINATE PACKING

Guy E. Horvath, Williamsville, N.Y., assignor to Hercules Packing Corporation, Alden, N.Y.

Filed June 25, 1969, Ser. No. 836,252
Int. Cl. B32b *3/10*
U.S. Cl. 161—113 16 Claims

A molded laminate packing composed of a plurality of coated fabric layers having a uniform disposition or arrangement of such fabric layers so as to achieve improved physical properties for such packing and a method for preparing such packing.

3,664,909

NEEDLED RESIN FIBROUS ARTICLE

Richard H. Ackley, Oakmont, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 25, 1970, Ser. No. 22,534
Int. Cl. B32b *5/06, 5/26, 5/28*
U.S. Cl. 161—141 11 Claims

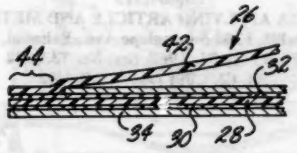
Fibrous mats comprised of unstranded filaments that are free to move relative to each other and fibrous mats comprised of fibrous strands that are free to move relative to each other, as well as combinations thereof, are impregnated with resin and subsequently molded into resinous products.

3,664,910

IDENTIFYING DEVICE FOR DOCUMENTS

Manuel E. Hollie, 27201 Orange Ave., Redlands, Calif.

Filed Mar. 30, 1970, Ser. No. 23,622
Int. Cl. B32b *3/02, 7/06*
U.S. Cl. 161—147 1 Claim



A document identification and protection system in which a stamplike patch is adhesively attached to a document such as a check, credit purchase invoice, and the like at the time of making the purchase, or writing the check. After peeling away a protective backing from the patch, a fingerprint is impressed on the exposed tacky surface, and a transparent cover sheet is then laid down over the print and adhered to the tacky surface, to protect and preserve the print. If the document is later questioned, the fingerprint can be photographed through the transparent cover sheet.

3,664,911

DIAPHRAGM FOR SOUND INSTRUMENT AND METHOD FOR PRODUCING SAME

Yoshikazu Takabayashi, Hamamatsu-shi, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Shizuoka-ken, Japan

Filed Dec. 23, 1969, Ser. No. 887,800
Claims priority, application Japan, Dec. 30, 1968, 43/96580
Int. Cl. B32b *5/16, 5/18, 5/26*
U.S. Cl. 161—160 2 Claims

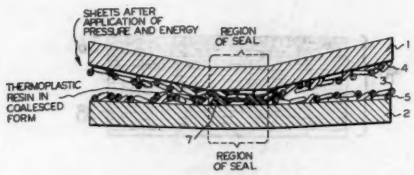
A diaphragm for sound instrument and method for producing same in which the diaphragm comprises an assembly of foamed granules of thermoplastic resin, binder layer surrounding the foamed granules and connecting them together to form an integral body of the diaphragm and a fibrous reinforcing material applied on at least one surface of said body and embedded in the binder to form a reinforcing layer.

3,664,912

SELF-BONDABLE PRINTING PAPER

Robert A. Olson, York New Salem, Pa., assignor to P. H. Glatfelter Company, Spring Grove, Pa.

Filed May 29, 1969, Ser. No. 828,974
Int. Cl. B32b 3/26, 27/08, 27/30
U.S. Cl. 161—161 20 Claims



The invention is directed to coated papers, which has been coated with a new and improved coating composition for imparting thereto (1) the printing properties of typical clay-coated printing papers and (2) heat sealing properties found in plastic films and plastic film-laminated papers. This paper comprises a white opaque paper substrate and an applied white opaque coating composition comprising an aqueous dispersion of 5–20 percent resinous binder, 15–75 percent opaque pigment such as inorganic pigment, and 20–65 percent discrete thermoplastic resin particles with a coalescing range of at least 140° F., and preferably 140°–400° F., in which the above-listed percentages of components are based on the dry weight of the total dry solids content of the coating composition.

3,664,913

INDICIA APPLYING ARTICLE AND METHOD

Ralph A. Ratcliff, 1300 Sunnyslope Ave., Belmont, Calif.

Filed May 31, 1968, Ser. No. 733,684
Int. Cl. C09j 1/00; C23f 1/02
U.S. Cl. 161—167 7 Claims

An articles and method for applying identifying or decorative indicia to a parent body, such as the metal surface of an industrial tool or the like. Indicia forming material, for removing a portion of the parent body or for building up such parent body in a predetermined pattern, is carried in a self-supporting unit which isolates the indicia forming material prior to use. Etching acid solutions thickened to a gel or paste-like consistency so as to be substantially self-supporting, or substances capable of bonding themselves to the parent body, are employed to react with the parent body to form the desired indicia thereon.

3,664,914

BIFILAR COMPOUND FILAMENTS OF POLYAMIDES

Harry Kubitzek; Karl-August Essig; Bela Von Falkai; Alfred Reichle, and Ferdinand Bodesheim, all of Dormagen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jan. 26, 1967, Ser. No. 612,047
Claims priority, application Germany, Jan. 28, 1966, F 48283; Feb. 24, 1966, F 48511
Int. Cl. B29f 3/10; D02g 3/00
U.S. Cl. 161—173 5 Claims

Bicomponent filaments having a slight non-linear crimp are prepared by spinning a conjugated filament from polyaurolactam and a second linear, readily crystallizable homo- or co-polyamide, stretching the filament, and then subjecting it to a heat treatment.

3,664,915

SEALING MATERIAL

Wilbert L. Gore, Newark, Del., assignor to W. L. Gore & Associates, Inc.

Filed Oct. 3, 1969, Ser. No. 863,446
Int. Cl. B29d 7/24; B32b 27/02, 27/32
U.S. Cl. 161—164 9 Claims

Polymers of tetrafluoroethylene are converted into shaped articles which have a uniform cross-section along one axis, such as ribbons or sheets, which are then processed to produce a fibrillated expanded material. An expanded article or material of this invention is one which has been processed to produce a new article or material of the same uniformity and cross-section shape as the former, but having a lesser specific gravity than it possessed initially. The term "expanded" as defined herein means lesser specific gravity. In producing the articles of this invention, the fibrillar structures of the molecules within the article are expanded under conditions in which the article is stretched without causing significant decreases in the width or the thickness of the article. In so doing, the specific gravity of the resulting article is substantially and valuably decreased. Less of the material is needed in effecting formations of seals such as used in the formation of pipe joints. The resultant materials are advantageously less slippery and more self-cohesive than the initial material. Further, they are more readily handled and can be used with ease at low temperatures.

3,664,916

POLYAMIDE-BASED COMPOSITE FILAMENTS

Rene Grellier, Chavanoz (Isere), and Claude Guyot, Besancon (Doubs), both of France, assignors to Societa Rhodiaceta, Paris, France

Filed Nov. 19, 1969, Ser. No. 878,184
Claims priority, application France, Sept. 25, 1969, 6932801
Int. Cl. D02g 3/02
U.S. Cl. 161—173 7 Claims

A composite yarn comprising hexamethylene diamonium polyadipate or polyhescamethylene adipamide and a copolyamide prepared from hexamethylene diamonium adipate and a salt derived from a diacid containing six to 12 carbon atoms and a cycloalkane diamine has a latent crimp and is suitable for use in the manufacture of woven fabrics, knitted fabrics or carpets.

3,664,917

TWO-COMPONENT POLYAMIDE YARNS

Rene Grellier, Chavanoz, and Claude Guyot, Besancon, both of France, assignors to Societe Rhodiaceda, Paris, France

Filed Nov. 24, 1969, Ser. No. 879,594
Claims priority, application France, Oct. 20, 1969, 6935853; Nov. 25, 1968, 175207
Int. Cl. D02g 3/02
U.S. Cl. 161—173 7 Claims

A composite yarn comprising (a) hexamethylene polyadipamide and (b) a ternary copolyamide prepared from hexamethylenediammonium adipate, hexamethylenediammonium terephthalate and an additional salt derived from an aliphatic dicarboxylic acid containing six to 12 carbon atoms and a hexamethylenediamine or a cycloalkane diamine has a latent crimp which can be developed by heat and is particularly suitable for use in the manufacture of hosiery.

3,664,918

VAPOR PHASE PULPING OF WATER SATURATED LIGNOCELLULOSIC MATERIALS

David W. Clayton, Hudson, and Asahi Sakai, St. Laurent, Quebec, both of Canada, assignors to Pulp and Paper Research Institute of Canada, Pointe Claire, Quebec, Canada

Filed Dec. 9, 1969, Ser. No. 883,470
Int. Cl. D21c 3/26
U.S. Cl. 162—19 6 Claims

Impregnating a water-saturated lignocellulosic material with an alkaline cooking liquor at a temperature below about 110° C., removing excess cooling liquor from the impregnated material, and delignifying the impregnated material by rapidly heating with steam.

3,664,919

VAPOR PHASE POLYSULPHIDE LIQUID PULPING OF LIGNOCELLULOSIC MATERIALS

David W. Clayton, Hudson, Quebec, and Asahi Sakai, St.-Laurent, Quebec, both of Canada, assignors to Pulp and Paper Research Institute of Canada, Pointe Claire, Quebec, Canada

Filed Dec. 9, 1969, Ser. No. 883,475. The portion of the term of the patent subsequent to May 9, 1989, has been disclaimed.
Int. Cl. D21c 3/26
U.S. Cl. 162—19 9 Claims

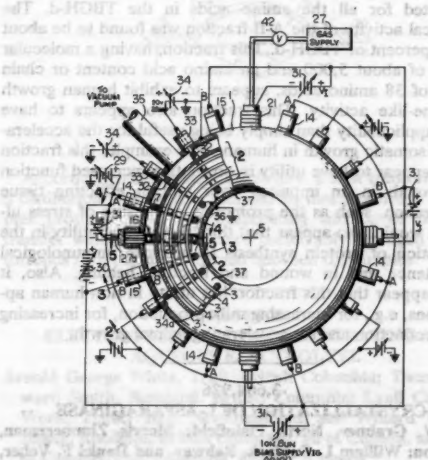
Impregnating lignocellulosic material, previously saturated with water, in a first stage with an alkaline polysulphide cooking liquor, removing excess liquor, and then cooking the impregnated material in a second stage by rapidly heating with steam.

3,664,920

ELECTROSTATIC CONTAINMENT IN FUSION REACTORS

Robert L. Hirsch, Potomac, Md., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed June 21, 1968, Ser. No. 738,940
Int. Cl. G21b 1/00
U.S. Cl. 176—1 9 Claims



Apparatus is disclosed for producing controlled nuclear-fusion reactions. A generally circular cathode has concentrically positioned therein a generally circular anode having multiple openings for the free flow of electrons therethrough. The anode encloses a volume free of tangible structure. An electron-emissive electrode in the interelectrode space between the anode and cathode emits electrons which penetrate the anode and enter the central volume, establishing a negative space charge therein. Ions of a fusion reacting gas are injected at a location within the volume, at a potential less than that applied to the anode, and are focused toward a common cross-over point in the central portion thereof. The magnitude of the negative space charge as well as the energies of the ions introduced into the volume are so controlled that collisions of the ions at or near the cross-over point result in the fusing thereof.

Electrons introduced in the interelectrode space traverse the cathodic space, thereby making a number of trips through the anode.

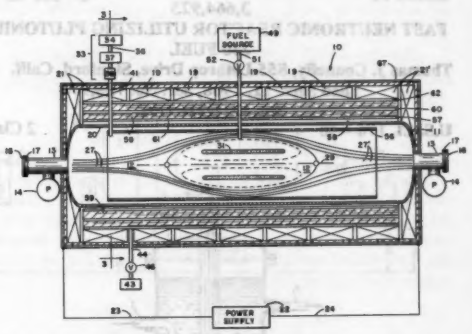
In this invention, the anode structure is effectively shielded such that electron interception thereby with consequent high energy electron losses can be made to approach zero. This is accomplished by creating a magnetic field around the portions of the anode which define the openings, this field serving to shield the conducting portions thereof.

3,664,921

PROTON E-LAYER ASTRON FOR PRODUCING CONTROLLED FUSION REACTIONS

Nicholas C. Christofilos, Hayward, Calif., assignor to The United States of America as represented by the United States Atomic Energy Commission

Filed Oct. 16, 1969, Ser. No. 868,287
Int. Cl. G21b 1/00
U.S. Cl. 176—4 11 Claims



High energy charged particles (molecular ions) are injected and trapped in a linear axial magnetic mirror containment field to produce a cylindrical E-layer of relativistic ions, e.g., protons rotating about the axis of said field. The magnetic field of said E-layer interacts with the mirror field to produce a pattern of closed magnetic field lines defining a charged particle containment zone into which neutral fuel materials may be introduced to be ionized by interaction with the E-layer particles forming a high temperature gas or plasma therein.

3,664,922

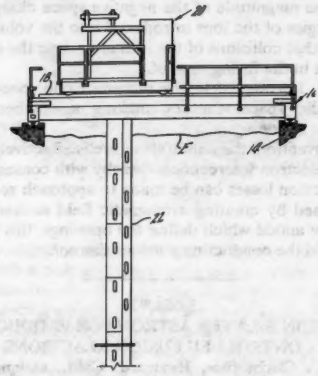
IN-SERVICE INSPECTION OF REACTOR VESSEL WELDS

Gordon A. Diwinsky, Windsor, and Richard P. Kosky, East Granby, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Dec. 18, 1969, Ser. No. 886,231
Int. Cl. G21c 19/00
U.S. Cl. 176—19 R 8 Claims

Method and apparatus for in-service inspection of nuclear reactor vessel welds. A support mechanism housing an inspection device is positioned within the reactor vessel after

the internals thereof are removed. The hoist mechanism for the refueling device is then used to manipulate the inspection device from its support mechanism to the weld areas to be inspected. The inspection device includes means for remote



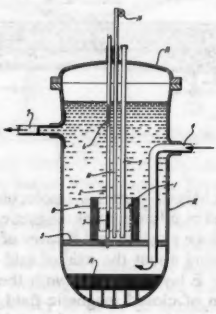
visual and volumetric examination of the cladding and weld surfaces, respectively, as well as a displacement indicating means for determining the position of the inspection device with respect to the weld being inspected.

3,664,923

FAST NEUTRONIC REACTOR UTILIZING PLUTONIUM 240 FUEL

Thomas J. Connolly, 855 Lathrop Drive, Stanford, Calif.

Filed Sept. 11, 1968, Ser. No. 758,974
Int. Cl. G21c *1/02*
U.S. Cl. 176—40 2 Claims



A fast neutron fission chain reactor utilizes plutonium enriched in the isotope plutonium 240 as its principal fuel. A novel reactor concept employs a core comprising a critical mass of the subject isotope in combination with other isotopes, together with specially adapted control, safety, and related devices.

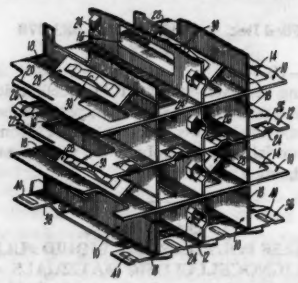
3,664,924

NUCLEAR REACTOR SPRING FERRULE SPACER GRID

Donald M. Krawiec, Thompsonville, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed June 24, 1968, Ser. No. 748,149
Int. Cl. G21c *3/34*
U.S. Cl. 176—78 14 Claims

A bimetallic spacer grid for nuclear reactors comprising a plurality of spacer elements and spring ferrules which are mated to form the grid assembly. The spacer elements are comprised of a material having a characteristic low neutron capture cross section and are formed with outwardly extending arches while the spring ferrules are formed from a material which has better stress relaxation qualities than the materi-



al employed for the spacer elements and which will thus not suffer a substantial decrease in resiliency due to prolonged exposure to intensive radiation. The spring ferrules and spacer element arches cooperate to support each fuel element at five points of contact.

3,664,925

CLINICALLY ACTIVE BOVINE GROWTH HORMONE FRACTION

Martin Sonenberg, 345 East 68th St., New York, N.Y., and Nobuyuki Yamasaki, Faculty of Agriculture, Ehime University, Tarumi-cho, 118, Matsuyama City, Japan

Filed Feb. 20, 1970, Ser. No. 13,162
Int. Cl. C12d *13/06*
U.S. Cl. 195—29 6 Claims

A clinically active component (TBGH-d) of a tryptic digest of bovine growth hormone (BGH) found to be homogeneous by disc electrophoresis and sedimentation equilibrium and having substantially the same molecular weight and amino acid composition as BGH was separated into two fractions, A-I and A-II, by dextran gel filtration in 50 percent acetic acid. The amino acid analysis of the A-I and A-II fractions accounted for all the amino acids in the TBGH-d. The biological activity of the A-II fraction was found to be about 10–30 percent of TBGH-d. This fraction, having a molecular weight of about 5,000 and an amino acid content or chain length of 38 amino acids, appears to exhibit human growth hormone-like activity. This fraction also appears to have wider applicability than simply being useful for the acceleration of somatic growth in humans. For example, this fraction would appear to have utility in promoting increased function and growth in an impaired liver and in effecting tissue regeneration, such as the promotion of healing of stress ulcers. It would also appear that this fraction has utility in the stimulation of protein synthesis to increase immunological competence and in wound and fracture healing. Also, it would appear that this fraction has utility in non-human applications, e.g., for increasing milk production, for increasing wool production and for accelerating animal growth.

3,664,926

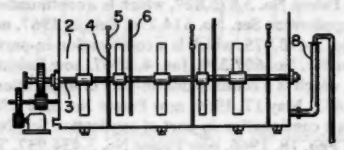
CRYSTALLIZATION OF L-ASPARAGINASE

Roy W. Grabner, North Plainfield; Morris Zimmerrman, Edison; William L. Subjack, Rahway, and Daniel F. Veber, Westfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Feb. 26, 1970, Ser. No. 14,650
Int. Cl. C07g *7/02*
U.S. Cl. 195—66 A 9 Claims

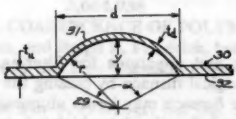
L-asparaginase is obtained in crystalline form from aqueous solutions thereof by the use of a water miscible, polar organic solvent and pH control.

3,664,927
APPARATUS FOR CONTINUOUS HYDROLYSIS OF RAFFINOSE
Junichi Shimizu, and Toshio Kaga, both of Tokyo, Japan, assignors to Hokkaido Sugar Company, Ltd., Tokyo, Japan
Filed Sept. 25, 1969, Ser. No. 860,876
Claims priority, application Japan, Oct. 7, 1968, 43/72676
Int. Cl. C12b 1/02
U.S. Cl. 195—141 4 Claims



An apparatus comprising a U-shaped open reaction vessel which is separated into a plurality of chambers by boundary plates which are so constructed as to allow sugar syrup or juice to overflow through replaceable screen nets fitted at the upper parts of the boundary plates; and said chambers are equipped with an interfering plate and each chamber is equipped with stirrers between the interfering and boundary plates.

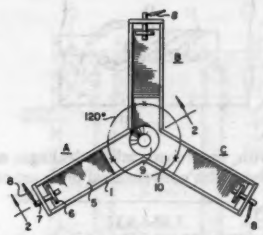
3,664,928
DIMPLED HEAT TRANSFER WALLS FOR DISTILLATION APPARATUS
Ernest Roth Roberts, Claremont, Calif., assignor to Aerojet-General Corporation, El Monte, Calif.
Filed Dec. 15, 1969, Ser. No. 885,116
Int. Cl. B01d 3/08; C02b 1/04; B01d 3/28, 1/22, 3/00, 1/00
U.S. Cl. 202—236 13 Claims



According to the present disclosure, a heat transfer wall of a distillation apparatus is dimpled so that a plurality of dimples protrude from the evaporating surface of the heat transfer wall. The dimples are preferrably arranged so that tortuous flow paths are formed between the dimples.

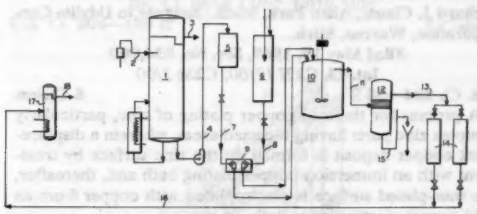
3,664,929
ELECTROTHERMALLY CONCENTRATING AN AQUEOUS ELECTROLYTE
Arnold George White, Trail, British Columbia; Thomas Edward Smith, Rossland, British Columbia; Lyall Campbell Work, Trinity Bay, Newfoundland, and Willard Wallace Miller, Rossland, British Columbia, all of Canada, assignors to Cominco Ltd., Montreal, Quebec, Canada
Filed Aug. 8, 1969, Ser. No. 848,486
Claims priority, application Canada, Aug. 9, 1968, 027,209
Int. Cl. C10b 3/00
U.S. Cl. 203—10 6 Claims

There is described an electrothermal cell provided with a region of reduced cross-sectional area, measured at right angles to the current path between the electrodes, compared with the cross-sectional area of the cell in the region of the electrodes. Such a cell displays good characteristics during electrolysis. In particularly there is little vapor formation in



the region of the electrodes. A process of heating or concentration using the cell is also described.

3,664,930
PROCESS FOR THE REGENERATION OF ALKANOLAMINES BY DISTILLATION, ALKALI HYDROXIDE TREATMENT, HEAT, PHASE SEPARATION AND DISTILLATION
Fernand Pottiez, Ostende, and Raphael Verbeest, Roulers, both of Belgium, assignors to UCB, Societe Anonmy
Filed Mar. 11, 1969, Ser. No. 806,270
Claims priority, application Great Britain, Mar. 14, 1968, 12,506/68
Int. Cl. B01d 3/34; C07c 91/04
U.S. Cl. 203—37 12 Claims

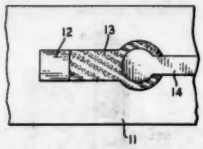


A process for the regeneration of dialkanolamines from their thermostable degradation products with impurities of gases, formed during the washing of said gases with dialkanolamine-containing washing liquors, which comprises adding to the concentrated distillation residues containing said degradation products a 15 to 25% aqueous sodium hydroxide solution or a 25 to 35% aqueous potassium hydroxide solution, either containing the stoichiometric quantity of 100% NaOH or KOH, heating to boiling for at least 15 minutes whereupon two phases are obtained, an aqueous and an organic, decanting the latter and distilling it to eliminate alkali and excess water and recycling the regenerated alkanolamine to the gases washing stage.

3,664,931
METHOD FOR FABRICATION OF THIN FILM CAPACITOR
Dieter Gerstenberg, 448 Benner Rd., Allentown, Pa.
Continuation of application Ser. No. 445,895, Apr. 6, 1965, now abandoned. This application July 27, 1970, Ser. No. 58,434
Int. Cl. C23f 17/00; C23c 15/00; C23b 9/00
U.S. Cl. 204—38 A 5 Claims

Thin film capacitors including a dielectric layer obtained by anodizing a layer obtained by sputtering a film-forming

metal in a nitrogen or carbon containing ambient at partial pressures ranging from 10^{-3} to 10^{-5} torr. manifest marked



improvement with regard to initial leakage and life test failure as compared with conventional prior art capacitors.

3,664,932

OBJECTS OF ALUMINUM AND ALLOYS OF ALUMINUM HAVING COLORED COATINGS AND PROCESS

Jos Patrie, Grenoble, France, assignor to Cegedur GP, Paris, France

Filed Dec. 3, 1969, Ser. No. 881,846
Claims priority, application France, Dec. 6, 1968, 176899
Int. Cl. C23j *5/50*
U.S. Cl. 204—35 N 18 Claims

The process for providing colored coatings on aluminum and alloys of aluminum in which the surface is first anodized to form a porous layer and colored particles of metal compound are deposited in the porous layer by alternating current electrolysis with the object mounted as an electrode in an electrolyte containing the salt of the metal, and then subjecting the deposited particles to dissolution by mounting the object as an anode for direct or rectified current electrolysis until a color of the desired value is secured.

3,664,933

PROCESS FOR ACID COPPER PLATING OF ZINC

Richard J. Clauss, Allen Park, Mich., assignor to Udylite Corporation, Warren, Mich.

Filed May 19, 1969, Ser. No. 834,909
Int. Cl. C23f *17/00*; C23c *3/00*
U.S. Cl. 204—38 S 6 Claims

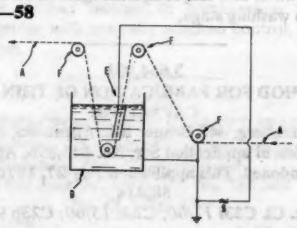
A process for the acid copper plating of zinc, particularly complex zinc parts having recessed areas, wherein a displacement copper deposit is formed on the zinc surface by treatment with an immersion copper plating bath and, thereafter, the thus-plated surface is electroplated with copper from an acid copper electroplating bath.

3,664,934

PROCESS FOR THE PREPARATION OF AN ALUMINUM SUPPORT FOR PRESENSITIZED PLANOGRAPHIC PRINTING PLATES

Siegfried Raether, Idstein/Tannus, Germany, assignor to Kalle Aktiengesellschaft, Wiesbaden-Biebrich, Germany

Continuation-in-part of application Ser. No. 753,493, Aug. 19, 1968, now abandoned, which is a division of application Ser. No. 535,927, Mar. 21, 1966, now Patent No. 3,481,798.
This application Aug. 24, 1970, Ser. No. 66,584
Claims priority, application Germany, Mar. 23, 1965, P 15 46 785.3
Int. Cl. C23b *9/02*
U.S. Cl. 204—58 9 Claims



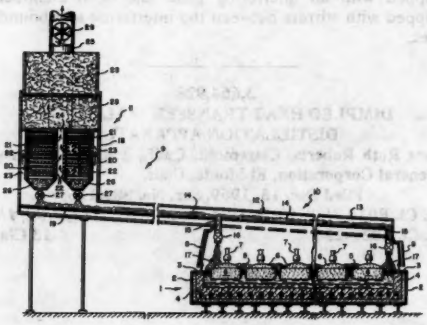
This invention relates to a process for the preparation of an improved bohmite coating on aluminum which comprises treating the aluminum with water at an effective elevated temperature while passing a galvanic electric current of low voltage from the aluminum as one electrode through the water.

3,664,935

EFFLUENT FILTERING PROCESS AND APPARATUS FOR ALUMINUM REDUCTION CELL

Arthur F. Johnson, 203 Creole Lane, Franklin Lakes, N.J.

Continuation-in-part of application Ser. No. 688,578, Dec. 6, 1967, now Patent No. 3,575,827, which is a continuation-in-part of application Ser. No. 614,294, Feb. 6, 1967, now Patent No. 3,470,075, which is a continuation-in-part of application Ser. No. 607,330, Jan. 4, 1967, now Patent No. 3,434,958, which is a continuation-in-part of application Ser. No. 550,653, May 17, 1966, now Patent No. 3,501,386, which is a continuation-in-part of application Ser. No. 528,503, Feb. 18, 1966, now Patent No. 3,434,957. This application Jan. 21, 1971, Ser. No. 108,333
Int. Cl. C22d *3/12*, *3/02*
U.S. Cl. 204—67 23 Claims



The process and apparatus for filtering effluent issuing from a metallurgical furnace by passing the effluent through a sorbent. The furnace may be an aluminum reduction cell with the sorbent being alumina which is being fed to the cell. With an aluminum reduction cell, the effluent is first fed through a bed of alumina which is kept in a fluidized state by the effluent passing therethrough. The effluent from the fluidized bed is then passed through a non-fluidized wall of alumina which further filters the effluent and captures the alumina dust escaping from the fluidized bed. During this filtering, the alumina in the non-fluidized wall with the effluent contained therein is fed to the fluidized bed of alumina. In turn, the alumina in the fluidized bed together with the effluent contained therein is fed back to the cell from which effluent originally issued.

3,664,936

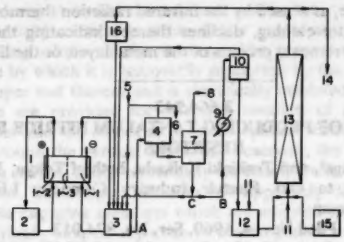
ELECTROLYTIC HYDRODIMERIZATION OF ACRYLONITRILE

Maomi Seko, Tokyo; Akira Yomiyama, Nobeoka-shi; Yasunobu Takahashi, Nobeoka-shi; Shigetoshi Seta, Nobeoka-shi, and Koji Nakagawa, Nobeoka, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed May 8, 1970, Ser. No. 35,727
Claims priority, application Japan, May 8, 1969, 44/34806
Int. Cl. C07b *29/06*; C07c *121/26*
U.S. Cl. 204—73 A 12 Claims

A method of producing adiponitrile by electrolytic hydrodimerization of acrylonitrile which comprises conduct-

ing the electrplysis while purifying the catholyte by recover-



ing the conductive supporting salt in the waste catholyte by means of a cation exchange resin.

3,664,937

PHOTOSENSITIZING MOLDING AND COATING COMPOSITIONS WITH BENZOIN-SILYL-ESTERS

Karl Fuhr; Hugo Vernaleken; Hans-Georg Heine, all of Krefeld; Hans Rudolph, Krefeld-Bockum, and Hermann Schnell, Krefeld-Uerdingen, all of Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Original application Oct. 20, 1969, Ser. No. 867,938. Divided and this application May 27, 1971, Ser. No. 147,675
Claims priority, application Germany, Nov. 6, 1968
P 18 07 297.4
Int. Cl. C08d *1/00*; C08f *1/16*
U.S. Cl. 204—159.15 **7 Claims**

The invention relates to possibly α-substituted benzoin-silyl-esters which are useful photosensitizers for the photopolymerization of polymerizable compounds or compound mixtures including mixtures of unsaturated polyesters and copolymerizable monomeric compounds.

3,664,938

ELECTRICAL COALESCENCE OF POLYMER FINES

Edward J. Thomas, and Ralph E. Friedrich, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 5, 1970, Ser. No. 788
Int. Cl. B01d *21/00*
U.S. Cl. 204—180 R **3 Claims**

Polymer fines suspended in the organic phase recovered from the polymerization of a suspension of aqueous water-soluble monomer in an organic liquid are precipitated by deposition or agglomeration by the application of an electrical field. The process is particularly applicable to the purification for recycle of an organic medium such as xylene in the inverse suspension polymerization of acrylamide.

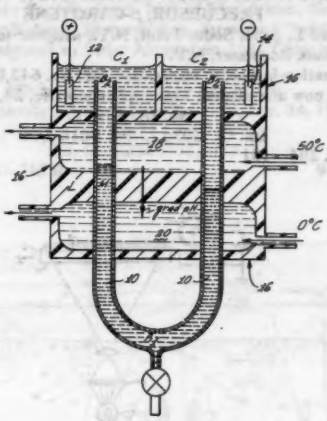
3,664,939

ISOELECTRIC FOCUSING AND FRACTIONATION AMPHOLYTES IN THERMALLY ENGENDERED PH GRADIENTS

Stephen J. Luner, Sherman Oaks, and Alexander Kolin, Bel Air, both of Calif., assignors to Regents of the University of California, Berkeley, Calif.

Filed Apr. 22, 1970, Ser. No. 30,712
Int. Cl. B01k *5/00*; B01d *59/42*
U.S. Cl. 204—180 R **19 Claims**

A method is provided for converting extended volumes of mixtures of proteins, or other ampholytes, into an isoelectric spectrum, or sorting pattern, of sharp narrow ampholyte zones located at points of a pH gradient corresponding to the isoelectric pH value of the individual ampholytes. A temperature gradient is established in an electrophoretic buffer column, and the temperature gradient provides a stable pH gradient which can be easily controlled by variations of the



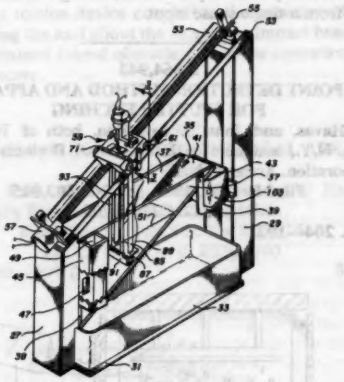
temperature limits, and which remains stable when an electric current is passed through the buffer column.

3,664,940

SUSPENSION DEWATERING METHOD

me Greyson, and Howard H. Rogers, both of Woodland ...lls, Calif., assignors to The United States of America as represented by the Secretary of the Interior

Filed Oct. 6, 1969, Ser. No. 870,443
Int. Cl. B01d *13/02*; B01k *5/00*
U.S. Cl. 204—180 R **5 Claims**

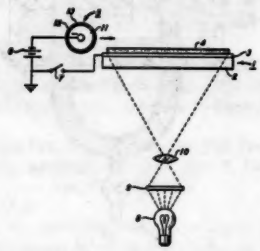


A method and device for removing water from normally difficult to filter suspensions, such as sludge wherein the suspension is disposed in a container having a negatively charged cathodic screen bottom surface and a moveable anode screen specially disposed within the suspension from the bottom cathode surface, together with means for controlling the electric potential between the anode and cathode, as well as the distance therebetween such that the water or other effluent can be removed through the cathode screen bottom surface leaving a cake of higher solids content. Additionally, means is provided for removing the cake formed between the cathode and anode from the suspension and continue the removal of water therefrom, while the cake is out of the suspension environment.

3,664,941
PHOTOELECTROPHORETIC REVERSAL IMAGING USING A SUSPENSION CONTAINING A VITAMIN PRECURSOR, β-CAROTENE

Raymond L. Jelfo, Sodus Point, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Continuation-in-part of application Ser. No. 642,005, May 29, 1967, now abandoned. This application Dec. 24, 1969, Ser. No. 887,879
Int. Cl. G03g *13/04*; B01k *5/00*
U.S. Cl. 204—181 4 Claims

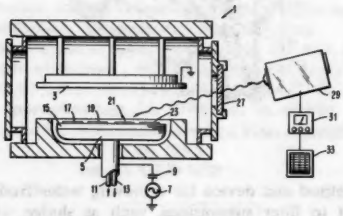


There is disclosed a photoelectrophoretic imaging system wherein the imaging suspension utilized contains a photomigratory pigment dispersed in an insulating carrier liquid. The imaging suspension contains a vitamin precursor, beta carotene, in conjunction with the other components of the vehicle. The suspension is interpositioned between at least two electrodes and subjected to a potential difference while substantially simultaneously being selectively exposed to a reproducible image by a source of electromagnetic radiation. As a result of the suspension of the present invention it is now possible by regulating the polarities of the electrodes in the system to produce both negative and positive images from a single sense input.

3,664,942
END POINT DETECTION METHOD AND APPARATUS FOR SPUTTER ETCHING

Janos Havas, and John S. Lechaton, both of Wappingers Falls, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 31, 1970, Ser. No. 103,045
Int. Cl. C23c *15/00*
U.S. Cl. 204—192 27 Claims

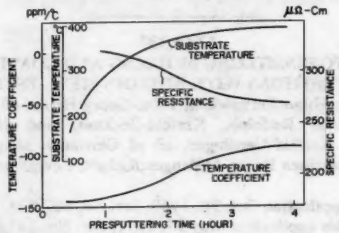


The end point in sputter-etching metal layers, for example, from substrates is determined by employing a silicon, quartz, or the like, monitor control wafer in the sputter-etching environment which wafer has been previously coated with said metal, for example, in the same run as that used to fabricate the workpiece substrate. Thus, the monitor control wafer exhibits the same thickness of metal, or the like, as the thickness of the metal layer to be selectively sputter-etched from the substrate. The temperature exhibited by the monitor control wafer during the sputter-etching material removal process in monitored by an infrared radiation thermometer, by way of a quartz window. When the layer of metal, or the like, has been removed from the monitor control wafer, the temperature, as sensed by the infrared radiation thermometer during sputter-etching, declines thereby indicating the end point in the removal process of the metal layer, or the like.

3,664,943
METHOD OF PRODUCING TANTALUM NITRIDE FILM RESISTORS

Shun Kumagai, and Toshiaki Koikeda, both of Tokyo, Japan, assignors to Oki Electric Industry Company Limited, Tokyo, Japan

Filed Nov. 4, 1969, Ser. No. 874,013
Claims priority, application Japan, June 25, 1969, 44/49700
Int. Cl. C23c *15/00*
U.S. Cl. 204—192 3 Claims

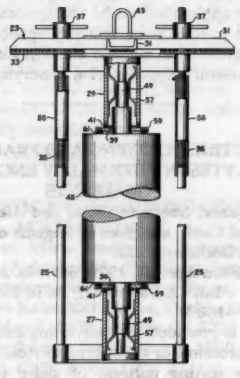


Hexagonal type tantalum nitride films are made by reactive sputtering with a sputtering current of more than 0.25 m.A./cm² at a sputtering voltage of more than 4.5 K.V. in a nitrogen gas atmosphere in which the mixed gas pressure of argon and nitrogen is 0.8×10^{-2} torr to 3×10^{-2} torr and the partial pressure of nitrogen gas is 5×10^{-5} torr to 10^{-3} torr, the substrate to receive the film being presputtered for a time of not more than one hour while being heated to a temperature of about 550°–770° C., which temperature is maintained during the main sputtering.

3,664,944
ELECTROPLATING APPARATUS

Edward Z. Buckley, Birmingham, Mich., assignor to Udylite Corporation, Warren, Mich.

Filed Oct. 29, 1969, Ser. No. 872,045
Int. Cl. C23b *5/68*
U.S. Cl. 204—212 10 Claims



An apparatus for use in electroplating cylindrically shaped objects which comprises a reservoir for an electroplating

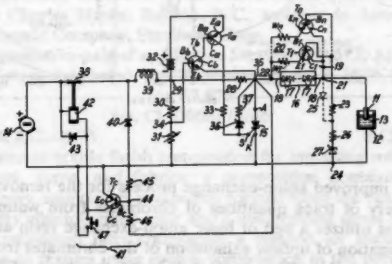
solution, said reservoir having a bottom, side walls and a substantially open upper end opposite the bottom. A support member is provided which is adapted to hold a cylindrically shaped object to be electroplated within the reservoir in a substantially vertical position below the level of the electroplating solution in the reservoir. The support member has means by which it is removably supported by the reservoir at the upper end thereof and is electrically insulated therefrom. Means are provided for effecting rotation of the support member and the object to be electroplated within the reservoir around the vertical axis of the reservoir, the rotation effecting means being electrically insulated from the support member. The support member has oppositely disposed, adjustable engaging members which are adapted to engage the cylindrically shaped object to be electroplated and hold it in a substantially vertical position within the reservoir. The engaging members are in electrical contact with the object to be plated and are electrically connected to that portion of the support member which is supported by the reservoir. There are means for providing electrical insulation between the electrical plating solution in the reservoir and the outer surfaces of the support member in contact therewith and means for preventing plating of that portion of the object to be plated at and contiguous to the point of electrical contact with the engaging members. Anode means are disposed within the reservoir, at least partially below the level of the electroplating solution and positioned between the reservoir side walls and the cylindrically shaped object to be electroplated which is held in the support member.

3,664,945

ARRANGEMENT FOR THE ELECTROLYTIC REMOVAL OF METAL

Jurgen Junker, Munich, and Richard Schleupen, Grossingersheim, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed June 16, 1970, Ser. No. 46,622
Claims priority, application Germany, June 18, 1969, P 19 30 765.4
Int. Cl. B01k *3/00*; B23p *1/00*
U.S. Cl. 204—228 **16 Claims**



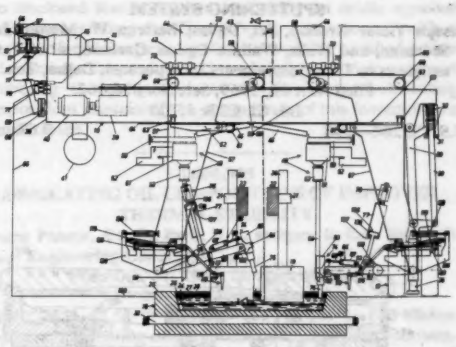
An arrangement for the electrolytic removal of metal from a metallic workpiece. An electrolyte in contact with the workpiece is held within a container to which negative potential is applied from a DC source. The workpiece has positive potential applied to it. The workpiece is connected in series with a reference circuit consisting of silicon diodes, and the anode-cathode path of a thyristor is connected in parallel with the series combination of the reference circuit, the workpiece, the electrolyte and the container therefor. Connected, furthermore, in parallel with the reference circuit, are the emitter-collector paths of a plurality of transistors with bases connected to the container at negative potential. The voltage drop across the reference circuit is made at least as large as the anode voltage required for switching the thyristor to the conducting state when the workpiece contacts the container maintained at negative potential.

3,664,946

CRUST BREAKER FOR ALUMINUM FUSION ELECTROLYSIS CELLS

Hans Schaper; Kurt Springer, both of Rheinfelden, Germany, and Edgar Kyburz, Richards Bay, Empageni, Natal, South Africa, assignors to Swiss Aluminium Ltd., Chippix, Switzerland

Filed Apr. 6, 1970, Ser. No. 25,750
Claims priority, application Switzerland, Oct. 24, 1969, 15877/69
Int. Cl. C22d *3/02, 3/12*
U.S. Cl. 204—243 R **9 Claims**



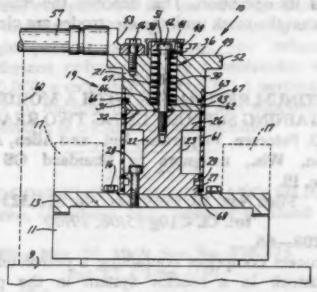
A slag crust breaker for aluminum fusion electrolysis cells is supported on a trolley carriage of a semi-portal crane, and comprises: a swingable, horizontally directed impact beam; pneumatic impact tool means hinged to the free end of the impact beam; an adjustable pneumatic driving device for driving the impact beam; a pneumatic control device for controlling the hold of the impact tool means in its vertical position; and a torsion device coupled to the impact tool means for deviating the tool about the axis of the impact beam when a predetermined lateral obstacle during the operation of the breaker occurs.

3,664,947

WORK HOLDER FOR ELECTROCHEMICAL ABRADING MACHINE

Miles M. Bass, Kalamazoo, Mich., assignor to Hammond Machinery Builders, Inc., Kalamazoo, Mich.

Filed Oct. 3, 1969, Ser. No. 863,616
Int. Cl. C23b *5/70*; B23p *1/00*
U.S. Cl. 204—297 R **8 Claims**



A work holder, particularly for an electro-chemical grinding machine, including an electrically conductive plate secured to an indexable rotatable table and having a plurality of work-holding fixtures thereon. A post extends upwardly

from the conductive plate for permitting electrical potential to be applied to the device at a location spaced above the work fixtures. The post includes an electrically conductive lower brush portion secured to the conductive plate and an electrically conductive upper brush portion in rotatable sliding contact with the lower brush portion. The upper brush portion is stationarily secured and fixedly connected to a current-conducting cable. A protective sleeve extends between and surrounds the upper and lower brush portions for preventing electrolyte from contacting the sliding contact surfaces therebetween.

3,664,948

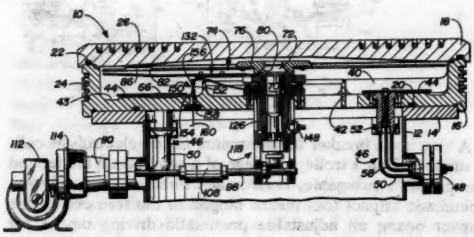
SPUTTERING SYSTEM

Joseph Victor Graffeo, Jr., Dallas; Bertran W. Mason, Jr., Sherman, and Wells, Wallace Ogden, Garland, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 19, 1969, Ser. No. 878,062

Int. Cl. C23c *15/00*

U.S. Cl. 204—298 **9 Claims**



A sputtering system includes a pair of spaced electrodes, one formed from titanium and the other formed from platinum. Substrates are rotated over both electrodes by a turntable that is actuated by a reversible drive mechanism. A mask alternately blocks each electrode. The mask is coupled to the turntable drive mechanism by a slip clutch and is moved between the two blocking positions when the direction of rotation of the turntable is reversed. In the use of the system, the electrodes are actuated in sequence. The mask is positioned to block each electrode during the initial portion of its operation. This deposits the material of the electrodes on the mask until the electrodes are clean.

3,664,949

PLATINUM REFORMING WITH A MORDENITE CONTAINING SUPPORT USING TWO REACTORS

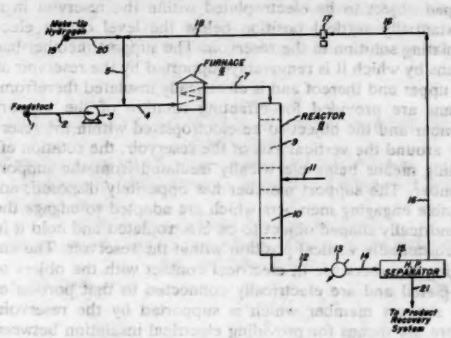
Richard D. Petersen, Valparaiso, Ind., and Allen, A. Kozinski, Madison, Wis., assignors to Standard Oil Company, Chicago, Ill.

Filed Nov. 10, 1969, Ser. No. 875,322

Int. Cl. C10g *35/08, 39/00*

U.S. Cl. 208—65 **23 Claims**

The process comprises contacting a petroleum hydrocarbon feedstock in a reactor system in the presence of hydrogen and under reforming conditions with a catalyst comprising a Group VIII metal, mordenite, and an adsorbent refractory inorganic oxide, such as catalytically active alumina. The reactor system is composed of a maximum number of two reactors. The preferred feedstock contains relatively high concentrations of aromatics and/or naphthenes. The above-described catalyst is the sole catalyst in said reactor system. The process employs a weight hourly space velocity



of at least 5. The process produces high yields of aromatics and gasolines having high octane numbers.

3,664,950

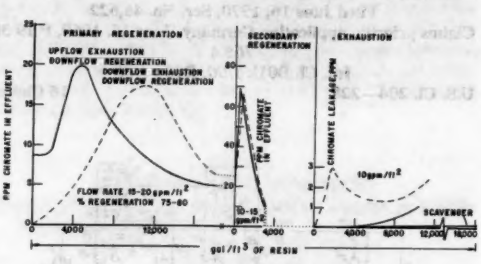
PROCESS FOR SELECTIVE REMOVAL AND RECOVERY OF CHROMATES FROM WATER

Anthony J. Saraceno, Chillicothe; Reed H. Walters, Waverly; Donald B. Jones, Chillicothe, and William E. Wiehle, Portsmouth, all of Ohio, assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed June 23, 1970, Ser. No. 49,102

Int. Cl. B01d *15/04*

U.S. Cl. 210—35 **10 Claims**



An improved anion-exchange process for the removal and recovery of trace quantities of chromates from water. The process utilizes a bed of basic anion-exchange resin and the combination of upflow exhaustion of the chromates from the water and downflow regeneration of the resin. Efficient recovery of chromates is accomplished while virtually eliminating chromate leakage during the initial portion of the exhaustion operation. Regeneration can be accomplished without the use of strong, expensive chemicals.

3,664,951

APPARATUS AND PROCESS TO TREAT WASTE WATER FOR POLLUTION CONTROL AND INDUSTRIAL REUSE

Louis B. Armstrong, Houston, Tex., assignor to Pollution Engineering International, Inc., Houston, Tex.

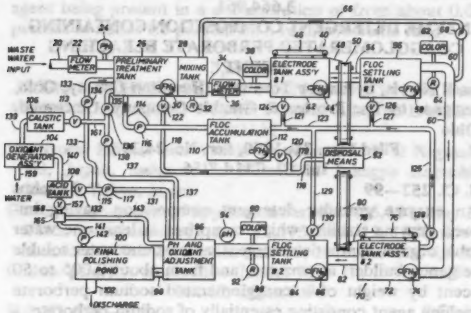
Filed July 22, 1970, Ser. No. 57,198

Int. Cl. C02b *1/36, 1/82*

U.S. Cl. 210—44 **58 Claims**

Apparatus and process for removing colloidal, oxygen demanding and odor causing organic materials, inorganic materials and other pollutants from waste water is provided.

The initial pH and resistivity of the water is measured and adjusted to predetermined values. The color of the water is then measured and organic and inorganic materials are caused to precipitate from the water which is then subjected to a predetermined density of electrical current. The electrolysis coalesces colloidal materials which are removed mechanically and causes additional material precipitation, as



well as acting to kill bacteria, viruses and other organic matter. Additional inorganic matter precipitation is induced and the water has a final pH, color and resistivity adjustment. An oxidizing agent is added to further reduce oxygen demanding and odor causing organic material and act on bacteria and other organic matter remaining. The water is then reusable or may be discharged into streams or sewer facilities.

3,664,952

AQUEOUS TEXTILE SOFTENING COMPOSITION

Bobby Charles Maske, Raleigh, N.C., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of application Ser. No. 627,672, Apr. 3, 1967, now abandoned. This application May 15, 1970, Ser. No. 37,875

Int. Cl. D06m *13/46*

U.S. Cl. 252—8.75 **5 Claims**

A cationic textile finish composition for imparting softness to fibers, yarns, and fabrics, a composition containing a quaternary ammonium compound formed from the reaction of a fatty alkanol amine ester and a quaternizing agent and a polyoxyethylated fatty compound; a method for imparting softness to textiles using such a composition in the products obtained.

3,664,953

CORROSION-INHIBITED SILICONE GREASE

John H. Wright, Elnora, N.Y., assignor to General Electric Company

Continuation-in-part of application Ser. No. 762,319, Sept. 16, 1968, now Patent No. 3,537,995. This application Apr. 6, 1970, Ser. No. 26,152. The portion of the term of the patent subsequent to Nov. 3, 1987, has been disclaimed.

Int. Cl. C10m *7/48*

U.S. Cl. 252—18 **5 Claims**

The addition of a metal chromate or dichromate to a silicone lubricating grease reduces galvanic corrosion during the lubrication of dissimilar metal surfaces which are separated by a lubricating film of the grease.

3,664,954

GROUP VI–B TRANSITION METAL-AMINO-PHOSPHORODITHIOATES IN LUBRICATING OIL

Vincent Chiola, Towanda, and Phyllis R. Dodds, Wysox, both of Pa., assignors to Sylvania Electric Products Inc.

Original application Sept. 5, 1968, Ser. No. 757,788, now Patent No. 3,598,848, dated Aug. 10, 1971. Divided and this application Apr. 1, 1970, Ser. No. 24,793

Int. Cl. C10m *1/48*

U.S. Cl. 252—32.7 E **4 Claims**

Group VI-B transition metal-amino-phosphorodithioates, which are the reaction products of amine salts of Group VI–B oxyacids and phosphorodithioic acids, are disclosed. A process for producing the beforementioned compounds is also disclosed that comprises contacting an acidic aqueous medium containing the Group VI–B metal source with a water-immiscible organic medium containing an alkyl amine and reacting said product with a phosphorodithioic acid and recovering the compounds of this invention. Lubricating compositions containing the compounds of this invention are also disclosed.

3,664,955

LUBRICATING OIL COMPOSITIONS OF IMPROVED THERMAL STABILITY

Jerome Panzer, Roselle Park, N.J., assignor to Esso Research and Engineering Company

Filed Dec. 31, 1969, Ser. No. 889,745

Int. Cl. C10m *1/38*

U.S. Cl. 252—47.5 **13 Claims**

Mineral lubricating oil compositions are prepared containing oil-soluble additives for sludge control, having improved high temperature oxidation stability and thus permitting longer periods of service before it becomes necessary to drain the used oil and replace it with fresh oil. The novel additive mixture is prepared by reacting elemental sulfur with long chain (C_{18+}) oil-soluble olefinically unsaturated monomeric or polymeric hydrocarbons, e.g. polyisobutylene, and using such sulfurized compounds in conjunction with conventional ashless dispersants with or without using additional ashless dispersants which have previously been reacted with elemental sulfur. Many of the hydrocarbons used as starting materials, in their unsulfurized state, have heretofore been used as viscosity index improvers in lubricating oil compositions.

3,664,956

GREASE COMPOSITIONS

Joseph F. Messina, Havertown, and Henry Gisser, Philadelphia, both of Pa., assignors to The United States of America as represented by the Secretary of the Army

Filed Sept. 26, 1969, Ser. No. 861,488

Int. Cl. C10m *7/50, 7/28*

U.S. Cl. 252—49.6 **6 Claims**

Stable grease compositions for use with equipment at extremely low temperatures, the greases consisting of about 69 to 78 weight percent polysiloxanes, the balance being tetrafluoroethylene polymer having a molecular weight of 10,000 — 50,000, a softening point of 321.1 percent, particle size less than 30 microns in diameter, and supplied as a 7.5 percent suspension in trichlorotrifluoroethane.

3,664,957

DEHYDROCONDENSED POLY(ORGANO) SILICONES

Leo J. McCabe, Glassboro, N.J., assignor to Mobil Oil Corporation

Filed Nov. 20, 1969, Ser. No. 878,575

Int. Cl. C10m *1/50*

U.S. Cl. 252—49.6 **6 Claims**

Dehydrocondensed poly(organo) silicones are produced by heating a poly(organo) silicone in the presence of an organic peroxide. The products per se, or in combination with other organic fluids, both mineral and synthetic, provide lubricating compositions evidencing good high temperature stability and antiwear properties.

3,664,958

GREASE COMPOSITIONS

Joseph F. Messina, Havertown, and Henry Gisser, Philadelphia, both of Pa., assignors to The United States of America as represented by the Secretary of the Army

Filed Sept. 26, 1969, Ser. No. 861,487
Int. Cl. C10m 7/28, 7/24
U.S. Cl. 252—54.6 5 Claims

Stable grease compositions for use with equipment at extremely low temperatures, the greases consisting of about 68 to 73.8 weight percent trimethylolpropane esters of n-heptoic and n-nonanoic acids in any combination of 10 to 90 weight percent of either, the balance being tetrafluoroethylene polymer having a molecular weight of 10,000–50,000, a softening point of 321.1° C., a particle size less than 30 microns in diameter, and supplied as a 7.5 percent suspension in trichlorotrifluoroethane.

3,664,959

DIELECTRIC SOLUTION CONTAINING A POLYCARBONATE-POLYDIMETHYLSILOXANE BLOCK COPOLYMER ADDITIVE

George L. Gaines, Jr., Scotia, and Donald G. Le Grand, Burnt Hills, both of N.Y., assignors to General Electric Company

Filed July 7, 1969, Ser. No. 839,642
Int. Cl. H01b 3/24, 3/42, 3/46
U.S. Cl. 252—63.7 6 Claims

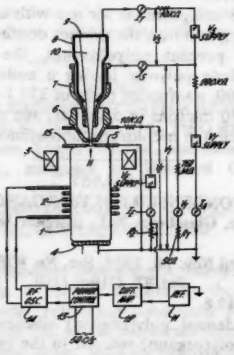
A dielectric solution with good wetting properties is disclosed as well as a dielectric material comprised of a polyolefin impregnated with the dielectric solution. The solution is comprised of a dielectric liquid and a block copolymer additive which is surface-active therein. The block copolymer is comprised of at least two polymerized comonomers, one of which is soluble in the dielectric liquid thereby distributing the block copolymer therein, and the second of which is sufficiently surface-active in the solution to produce a solution having a surface tension less than that of the dielectric liquid alone.

3,664,960

CONTROL CIRCUIT FOR NEUTRON GENERATOR TUBE

James David London Hedley Wood, Letchworth, England, assignor to National Research Development Corporation, London, England

Filed Jan. 24, 1969, Ser. No. 793,743
Claims priority, application Great Britain, Feb. 2, 1968, 5,556/68
Int. Cl. G21g 3/24
U.S. Cl. 250—84.5 5 Claims



In the supply circuit for an ion accelerator having an ion source and an ion extractor electrode, the supply circuit including an energizing supply for the ion source and a power supply for the extractor electrode, there is provided a negative feedback loop connected to cause the extractor electrode current to control the energizing supply output in a sense to maintain constant the extractor current. The described embodiment is a neutron generator tube having a plasma ion source energized by a radio-frequency supply.

3,664,961

ENZYME DETERGENT COMPOSITION CONTAINING COAGGLOMERATED PERBORATE BLEACHING AGENT

Russell Norris, Sycamore Township, Hamilton County, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Mar. 31, 1970, Ser. No. 24,395
Int. Cl. C11d 7/56
U.S. Cl. 252—99 7 Claims

An enzyme granular detergent composition having improved enzyme stability which comprises at least one water soluble organic synthetic detergent, at least one water soluble detergency builder, an enzyme, and from about 0.005 to 50 percent by weight of a coagglomerated sodium perborate bleaching agent consisting essentially of sodium perborate, a water-soluble polymeric organic agglomerating agent which forms a tacky solution with water at 72 ° F., and a water-soluble granular coagglomerant.

3,664,962

STAIN REMOVER

Jerry D. Kelly, Route 1, Hwy. 26, Milton Junction, Wis., and Forrest E. Beck, 302 West Union St., Rockton, Ill.

Continuation-in-part of application Ser. No. 736,290, June 12, 1968, now abandoned. This application Jan. 11, 1971, Ser. No. 105,737
Int. Cl. C09d 9/00, 9/04; C11d 9/26
U.S. Cl. 252—125 5 Claims

The stain remover is a semisolid which includes benzyl alcohol entrained in a sodium stearate matrix. The semisolid is rubbed against stained surfaces and releases the benzyl alcohol onto the surfaces as the sodium stearate matrix is worn away by friction. The benzyl alcohol eradicates the stain by solvation. It is especially effective in removing ball pen ink and will remove this type of ink even from vinyl plastic.

3,664,963

ENCAPSULATION PROCESS

Joseph Z. Pasin, New York City, N.Y., assignor to Balchem Corporation, Slate Hill, N.Y.

Filed Oct. 22, 1969, Ser. No. 868,619
Int. Cl. B01j 13/02; B44d 1/02
U.S. Cl. 252—316 8 Claims

A process for encapsulating an active material in a shell composition in which the capsule composition is formed by dispersing an active material and a shell composition in a solvent for the shell composition. Capsules are prepared by spraying the capsule composition into a bath of an anhydrous lower molecular weight polyglycol. The spraying operation serves to form the capsule composition into particles containing the active material as a dispersed phase in a solution of the shell composition and the lower molecular weight polyglycol serves to remove the solvent from the shell composition solution.

3,664,964

ELUENT FOR RADIOISOTOPES

Thomas A. Haney, East Brunswick, and Gerald A. Bruno, Shrewsbury, both of N.J., assignors to E. R. Squibb & Sons, Inc., New York, N.Y.

Filed July 3, 1968, Ser. No. 742,128
Int. Cl. B01f *1/00*; C22b *61/04*
U.S. Cl. 252—364 4 Claims

This disclosure relates to an eluent which improves the yield of nuclear radioisotopes from ion exchange resins. The disclosure in essence concerns itself with the addition of an oxidizing agent to an isotonic saline solution, said oxidizing agent being present in a concentration of from about 0.001 percent to about 1.0 percent on a volume/volume ratio.

3,664,965

FORMALDEHYDE-GELATIN COMPOSITION FOR GAS PRESSURE TESTING WHICH FORMS A LONG LASTING FOAM

Nobuyoshi Hirota, and Yoshio Onoshima, both of Nagasaki-shi, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of application Ser. No. 455,007, May 11, 1965, now abandoned , and 712,375, Mar. 12, 1968, now abandoned. This application Jan. 28, 1970, Ser. No. 6,548
Claims priority, application Japan, May 19, 1964, 39/28033
Int. Cl. G01m *3/04*
U.S. Cl. 252—408 9 Claims

Leak detecting agent for gas pressure testing consisting essentially of an aqueous solution of a coagulating agent present in an amount of 1.8–18 percent by weight of the solution and a foaming agent present in an effective amount to cause the formation of bubbles indicating the site of the leak, the solution also including an addition of an acid in an amount to adjust the pH range of the solution from 3–6, said range promoting hardening of a film formed from the solution upon elimination of water, and preservation of the bubbles in said film for many hours, thus enabling an observer to detect theleakage at a time convenient for inspection.

3,664,966

DEHYDROHALOGENATION CATALYST

Ronnie D. Gordon, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed Feb. 9, 1970, Ser. No. 9,961
Int. Cl. C07c *21/00*
U.S. Cl. 252—430 5 Claims

A dehydrohalogenation catalyst and process employing same in the manufacture of halogen unsaturated derivatives from saturated compounds is provided wherein the catalyst comprises from about 99.99 to 90 weight percent of an aqueous base wherein the base constituent is an alkali metal hydroxide or an alkaline earth metal hydroxide and from about 0.01 to about 10 weight percent of an organic quaternary salt compound having the general formula

where M is a pentavalent ion of an element selected from the group consisting of nitrogen, phosphorous, and arsenic, R_1, R_2, R_3, and R_4 are alkyl radicals containing from one to about 30 carbon atoms, and X is an anion derived from organic and inorganic acids which will disassociate from the cation portion of the organic quaternary salt in an aqueous environment.

3,664,967

PELLICULAR COLUMN PACKING FOR LIQUID CHROMATOGRAPHY

Rudolph H. Stehl, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Feb. 11, 1970, Ser. No. 10,617
Int. Cl. B01d *15/08*
U.S. Cl. 252—431 R 7 Claims

A halogenated organo silica gel or halogenated organo alumina prepared by reacting an organo halosilane with a silica gel or alumina gel of high relative surface area, then reacting the so-produced product with a halogen.

3,664,968

CATALYST FOR PREPARING UNSATURATED ACIDS AND ALDEHYDES

Jamal S. Eden, Akron, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.

Original application Nov. 16, 1967, Ser. No. 683,476, now Patent No. 3,576,857, which is a continuation-in-part of application Ser. No. 483,858, Aug. 30, 1965, now abandoned. Divided and this application Aug. 3, 1970, Ser. No. 67,647
Int. Cl. B01j *11/82*
U.S. Cl. 252—437 4 Claims

Unsaturated aldehydes and carboxylic acids as acrolein or methacrolein and acrylic acid or methacrylic acid are obtained by the reaction of propylene or isobutylene with oxygen at an elevated temperature in the presence of a catalyst containing a mixture of molybdenum oxide, tellurium oxide and an aluminum phosphate.

3,664,969

METHOD OF MAKING A THERMAL BED FOR GAS GENERATING

Theodore Hubbuch, Florence; James A. Murfree, Jr.; William A. Duncan, both of Huntsville; Billy J. Sandlin, Athens, and Henry A. Nappier, Lacey's Spring, all of Ala., assignors to The United States of America as represented by the Secretary of the Army

Original application July 5, 1967, Ser. No. 651,324. Divided and this application Nov. 12, 1968, Ser. No. 775,998
Int. Cl. B01j *11/82*
U.S. Cl. 252—438 5 Claims

The loading of a gas generating bed such as activated charcoal with a fluid such as dinitrogen tetroxide by exposing the bed to an atmosphere of the fluid.

3,664,970

ETHYLENE OXIDE CATALYST

Dennis A. De Maio, Staten Island, N.Y., assignor to Halcon International, Inc.

Continuation-in-part of application Ser. No. 723,915, Apr. 24, 1968, now abandoned. This application Apr. 17, 1969, Ser. No. 817,169
Int. Cl. B01j *11/40*
U.S. Cl. 252—454 4 Claims

The invention is directed to improvements in the production of ethylene oxide by the controlled, partial oxidation of ethylene in the presence of a silver supported catalyst.

New results and advantages including elimination of the need for halogenated inhibitors in the ethylene oxide process are attributable to the use of a silver impregnated catalyst comprising inert porous support particles wherein at least 90 percent of the pore diameters fall within a limited range and the average pore diameter falls within a narrow range.

The invention is also attended by supplemental benefits in the form of increased productivity and/or reduced operating temperature.

3,664,971

HYDROTHERMAL METHOD FOR MANUFACTURING A HYDROCARBON CONVERSION CATALYST CONTAINING AT LEAST ONE HYDROGENATING COMPONENT

Joseph Jaffe, Berkeley, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of application Ser. No. 763,922, Sept. 30, 1968. This application May 19, 1970, Ser. No. 38,887
Int. Cl. B01j 11/40; C01b 38/28
U.S. Cl. 252—455 R 3 Claims

Hydrothermal conversion method for manufacturing a hydrocarbon conversion catalyst useful in hydrogenative processes, said catalyst comprising a hydrogenating component and a novel synthetic layered crystalline clay-type aluminosilicate mineral, preferably in an intimate admixture with an amorphous cogel comprising silica and alumina, said method comprising subjecting to conditions of elevated temperature and pressure in a reaction zone a hydrogel or hydrogel slurry, said slurry comprising water, a component selected from fluorine and compounds of fluorine, and an amorphous cogel starting material comprising silica and alumina, until a substantial amount of said synthetic mineral is formed, preferably in an intimate admixture with a substantial amount of unreacted amorphous cogel comprising silica and alumina, incorporating in the reaction zone product a component comprising a hydrogenating metal, and drying and calcining the resulting composite to produce said catalyst.

3,664,972

HYDROTHERMAL METHOD FOR MANUFACTURING A CATALYTIC MATERIAL USEFUL IN PREPARING CATALYSTS FOR HYDROCARBON CONVERSION PROCESSES

Joseph Jaffe, Berkeley, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of application Ser. No. 763,922, Sept. 30, 1968. This application May 20, 1970, Ser. No. 39,174
Int. Cl. B01j 11/40; C01b 38/28
U.S. Cl. 252—455 R 4 Claims

Hydrothermal conversion method for manufacturing a catalytic material useful in preparing catalysts for hydrocarbon conversion processes, comprising coprecipitating silica and alumina in amorphous form as a hydrogel slurry in the presence of acetate ion, filtering and drying said slurry to produce a hydrogel material, washing said hydrogel material, and subjecting said washed hydrogel material to autoclave conditions of elevated temperature and pressure in a reaction zone until a substantial amount of a layered crystalline clay-type aluminosilicate mineral is formed, preferably in an intimate admixture with a substantial amount of unreacted amorphous cogel comprising silica and alumina, and if desired incorporating in the reaction zone product before or after drying thereof a component comprising a hydrogenating metal.

3,664,973

HYDROTHERMAL METHOD FOR MANUFACTURING A NOVEL CATALYTIC MATERIAL, CATALYSTS CONTAINING SAID MATERIAL, AND PROCESSES USING SAID CATALYSTS

Joseph Jaffe, Berkeley, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of application Ser. No. 763,922, Sept. 30, 1968. This application May 20, 1970, Ser. No. 39,518
Int. Cl. B01j 11/40; C01b 38/28
U.S. Cl. 252—455 R 17 Claims

(a) A synthetic layer-type, crystalline, clay-like mineral characterized by a particular formula and a particular d_{001} spacing; (b) the method of preparing a hydrocarbon conversion catalyst cracking component which comprises dehydrating said mineral; (c) the catalyst cracking component so prepared.

3,664,974

PHOSPHORUS CONTAINING POLYMERS

Margalit Cohen, and Kenneth E. MacPhee, both of Guelph, Ontario, Canada, assignors to Uniroyal, Ltd., Montreal, Quebec, Canada

Filed Feb. 19, 1970, Ser. No. 12,858
Int. Cl. C08g 33/16, 49/04
U.S. Cl. 260—2 P 14 Claims

New compositions of matter which are reaction products of a phosphate ester containing active groups such as —OH, —NH_2 and —SH and sufficient phosphorus trihalide or phosphorus oxyhalide to produce a polymer which is used as a fire retardant in plastic compositions.

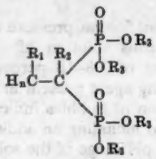
3,664,975

FLAME RESISTANT POLYURETHANE PREPARED BY ADDING AN ETHANE DIPHOSPHONATE INTO THE URETHANE-FORMING MIXTURE

Al F. Kerst, Littleton, Colo., assignor to Monsanto Company, St. Louis, Mo.

Filed Apr. 13, 1970, Ser. No. 27,985
Int. Cl. C08g 22/16
U.S. Cl. 260—2.5 AJ 4 Claims

Fire resistant polyurethane compositions are prepared by adding to the urethane-forming reaction mixture a substituted ethane diphosphonate having the formula



wherein R_1 and R_2 are hereinafter defined, R_3 is hydrogen or an organic radical, and n is an integer having a value of 1 or 2.

3,664,976

POLYURETHANE FOAM WITH INTEGRAL SKIN

Robert G. Evans, Fergus, Ontario, and George R. P. Stifel, Kitchener, Ontario, both of Canada, assignors to Uniroyal Ltd., Montreal, Quebec, Canada

Filed Aug. 21, 1969, Ser. No. 852,106
Int. Cl. C08g 22/46
U.S. Cl. 260—2.5 BD 10 Claims

Flexible foam with a soft skin is made by a one-shot process involving overpacking a mold with a mixture, in critical proportions, of: (a) a methylenebis(phenyl isocyanate) having a functionality between 2 and 2.7; (b) an hydroxyl terminated polyoxypropylene ether triol immiscible with (a); (c) an hydroxy terminated polyester miscible with (a) but immiscible with (b); (d) a low molecular weight glycol; (e) a volatile liquid blowing agent; and (f) a catalyst. During the mixing, an emulsion is formed thus preventing separation of the ingredients (foam defects). Due to its discontinuity the emulsion gives controlled rupture of cell walls (open cell foam). No surface active agent is used to control cell structure.

3,664,977

BULK POLYMERIZED AROMATIC HYDROCARBON IN RUBBER AND POLYPHENYLENE ETHER

Atsuo Nakanishi, Kanagawa-ken; Shinichi Izawa, Tokyo, and Mikio Sato, Yokohama, all of Japan, assignors to Asahi Dow Limited, Tokyo, Japan

Filed Nov. 17, 1969, Ser. No. 877,499
Claims priority, application Japan, Nov. 20, 1968, 43/84449
Int. Cl. C08c 9/14; C08d 9/08
U.S. Cl. 260—4 AR 5 Claims

A resin improved in impact resistance is obtained by continuously subjecting to bulk-polymerization a mixture com-

posed mainly of a vinyl aromatic compound and containing a rubbery substance; incorporating a mixture comprising an aromatic hydrocarbon and a polyphenylene ether into the system during a period from the stage immediately after the phase inversion of the rubbery substance to the stage where the total polymer concentration has become 40 percent, and further continuing the bulk-polymerization with thorough stirring until the polymerization is substantially completed.

The thus obtained resin has improved physical properties and gives a molded article excellent in appearance.

3,664,978

AGGLOMERATION OF FINE RUBBER PARTICLES

Carl A. Uraneck, and John E. Burleigh, both of Bartlesville, Okla., assignors to Phillips Petroleum Company

Filed June 22, 1970, Ser. No. 48,430
Int. Cl. C08c 9/08
U.S. Cl. 260—5 10 Claims

Latex is added to a suspension of solid particles comprising rubber in an aqueous medium to agglomerate the fine particles which are present.

3,664,979

POLYURETHANE ELASTOMER AND METHOD FOR PREPARATION OF SAME

Masahisa Tanomura, and Kazuo Itoi, both of Kurashiki City, Japan, assignors to Kuraray Co., Ltd., Kurashiki City, Japan

Filed Dec. 15, 1969, Ser. No. 885,281
Claims priority, application Japan, Dec. 16, 1968, 43/92525; Dec. 19, 1968, 43/93598; Mar. 15, 1969, 44/19748
U.S. Cl. 260—75 NK 12 Claims

Polyurethane elastomers having excellent resistance to hydrolysis and which are readily wet coagulated are prepared via the reaction of polymeric diols having molecular weights of about 800 to about 5,000, organic diisocyanates and chain extenders selected from the group consisting of aliphatic diols having two to four carbon atoms.

Said polymeric diols are polyester diols which are the reaction products of aliphatic dicarboxylic acids and mixed diols consisting of from 20 to 80 mol per cent of 2-ethyl hexane-1,3-diol and from 80 to 20 mol per cent of a diol selected from the group consisting of diethylene glycol, ethylene glycol, propylene glycol and butylene glycol; or a mixture of said polyester diol and at most 50 weight per cent based on the mixture of polyalkylene ether glycols, such as polypropylene glycol or polytetramethylene glycol.

3,664,980

POLYAMIDES OF POLYMERIC FAT ACIDS AND 1-AMINO-3-AMINOMETHYL-3,5,5-TRIMETHYL CYCLOHEXANE

Leonard R. Vertnik, Minneapolis, Minn., assignor to General Mills, Inc.

Continuation-in-part of application Ser. No. 671,604, Sept. 29, 1967, now abandoned. This application June 22, 1970, Ser. No. 48,559
Int. Cl. C08g 20/26
U.S. Cl. 260—18 N 15 Claims

There is disclosed polymeric fat acid polyamides of 1-amino-3-aminomethyl-3,5,5-trimethyl cyclohexane. Copolymerizing dibasic acids, amino acids or lactams or other diprimary diamines may also be employed. The polyamides are prepared under conventional amidification methods involving heating at 100°–300° C. for a time sufficient to effect amidification. The polymers find utility as adhesives (hot melt), self-supporting films and are particularly useful in the shoe industry for box toe printing applications.

3,664,981

POLYPHASE COMPOSITIONS AND PROCESS FOR THEIR PREPARATION

Bert H. Mahlman, West Chester, Pa., assignor to Hercules Incorporated, Wilmington, Del.

Continuation-in-part of Ser. No. 670,412, Sept. 25, 1967, abandoned.
Filed June 26, 1970, Ser. No. 50,299
Int. Cl. C09j 3/26
U.S. Cl. 260—27 4 Claims

Polyphase compositions having, as a continuous phase a propylene polymer and as a second phase a rosin or rosin derivative, are prepared by dispersing a propylene polymer of substantially all sub-micron particle size in the second phase and fusing the polymer under controlled conditions which assure the formation of the propylene polymer into a continuous phase.

3,664,982

REACTION PRODUCT OF HYDROLYZED SILOXANE AND AN IMINE POLYMER AND GLASS STRANDS COATED THEREWITH

Jerome A. Preston, Granville, and Carlton J. Davis, Sr., Newark, both of Ohio, assignors to Owens-Corning Fiberglas Corporation

Continuation of application Ser. No. 610,487, Jan. 20, 1967, now abandoned. This application Dec. 24, 1969, Ser. No. 884,781
Int. Cl. C08g 47/10
U.S. Cl. 260—29.4 9 Claims

An improved bonding material comprising a hydrolyzed siloxane and a polyimine which is dispersible in the siloxane. The coating material is preferably applied to glass fibers at forming from an aqueous solution, and the coated fibers are preferably used to strengthen a matrix resin which is fused with the coating material so that diffusion of the polyimine into the matrix resin takes place. Composites of the coated glass fibers with matrix resins that are reactive with amine hydrogen have great strength.

3,664,983

2-ACETOXY-4-OXA-ALKANESULFONATES, SYNTHETIC LATICES AND METHOD OF PREPARING SAME

Ted J. Logan, Colerain Twp., Hamilton, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Original application Mar. 20, 1969, Ser. No. 809,048, now abandoned. Divided and this application Feb. 2, 1971, Ser. No. 112,052
Int. Cl. C08d 7/18; C07c 143/02
U.S. Cl. 260—29.7 SQ 8 Claims

Compounds useful as surfactant compounds, 2-acetoxy-4-oxa-alkanesulfonates, are disclosed. The compounds, their method of preparation and use as detergents and emulsifiers are described. The compounds are particularly suited as emulsion polymerization surfactants in the emulsion polymerization of synthetic latices from vinylic monomers. The resulting latices are characterized by being low-foaming or non-foaming and find application in the preparation of adhesives foams, polishes, coatings and the like.

3,664,984

CATIONIC DYEABLE POLYESTER MODIFIED WITH ALKOXY BENZENE SULFONIC ACIDS

James E. Duddey, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Oct. 2, 1969, Ser. No. 863,342
Int. Cl. C08g 17/14, 17/16
U.S. Cl. 260—22 D 17 Claims

Polyesters are rendered more acceptable to basic dyes by adding to the polyester either during or after polycondensation certain metal, ammonium, or amine salts of alkoxy benzene sulfonic acids.

3,664,985

PREPARATION OF SILICON-FLUORIDE SILICONES

A. D. Britt, Falls Church, Va., and William B. Moniz, Clinton, Md., assignors to The United States of America as represented by the Secretary of the Navy

Filed July 27, 1970, Ser. No. 58,737
Int. Cl. C08f *11/04*
U.S. Cl. 260—46.5 R 3 Claims

A method is disclosed of selectively displacing hydride with fluoride at chain silicon positions in organopolysiloxane compounds. Also, 3-fluoroheptamethyltrisiloxane and the polymeric fluoro derivatives of liquid silicone hydrides are disclosed which have high thermal stability properties and are useful as high temperature-resistant release coatings.

3,664,986

1,2,5-THIADIAZOLE POLYMERS

Robert Neal MacDonald, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 14, 1969, Ser. No. 866,401
Int. Cl. C08g *20/20*
U.S. Cl. 260—78 R 8 Claims

Described and claimed are polymers containing 1,2,5-thiadiazole rings in the polymer chain and their preparations. The polymers are capable of being made into films, fibers, coatings and molded objects.

3,664,987

FUNCTIONAL SURFACE COATING COMPOSITIONS FOR CELLULOSIC MATERIAL

Ronald C. Moyer, Sellersville, and Melville W. Uffner, Media, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Dec. 15, 1969, Ser. No. 885,314
Int. Cl. C08d *3/04, 5/00*
U.S. Cl. 260—29.6 H 3 Claims

Functional surface coating compositions, prepared by blending a mixture of a fluorine containing phosphate material and a non-fluorine containing material in aqueous medium, impart solvent, grease and oil resistance to cellulosic materials.

3,664,988

POLYMERIZATION OF ETHYLENE WITH 3-METHYL-3-BUTEN-1-OL

Hans-Georg Trieschmann, Hambach; Helmut Pfannmueller, Limburgerhof; Hans Gropper, Ludwigshafen; Volker Gierth, Ludwigshafen, and Gilbert Beck, Ludwigshafen, all of Germany, assignors to Badische Anilin-& Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine) Germany

Filed Dec. 5, 1969, Ser. No. 882,710
Claims priority, application Germany, Dec. 18, 1968, P 18 15 328.1
Int. Cl. C08f *15/00, 15/40*
U.S. Cl. 260—80.75 4 Claims

A process for the production of ethylene copolymers containing hydroxyl groups which contain polymerized units of ethylene, an alkenol and if desired other monomers copolymerizable with ethylene, by copolymerization of a mixture of ethylene, alkenol and the other copolymerizable monomer(s), if any, at superatmospheric pressure and elevated temperature under the action of a free-radical polymerization initiator in the presence or absence of a polymerization regulator. 3-methyl-3-buten-1-ol is used as the alkenol. The process has the advantage that it is more easily carried out than comparable prior art methods and that it gives copolymers containing a relatively high proportion of polymerized units of alkenol.

3,664,989

METHODS FOR THE PREPARATION OF SYNTHETIC POLYMERS

Gennady Nikolaevich Petrov, Lesnoi prospekt, 61, kv. 85; Grigory Fedorovich Lisochkin, ulitsa Reshetnikova, 13, kv. 107; Valentin Parmenovich Shmagin, Kaznacheiskaya ulitsa, 4, kv. 39, and Olga Mikhailovna Shibanova, VO 15 Linia 8/40, kv. 21, all of Leningrad, U.S.S.R.

Continuation-in-part of application Ser. No. 575,552, Aug. 29, 1966, now abandoned. This application Oct. 27, 1969, Ser. No. 869,935
Int. Cl. C08d *3/04, 3/08*
U.S. Cl. 260—82.1 11 Claims

A method for the homopolymerization of conjugated diene hydrocarbons or for the copolymerization of different dienes either with one another or with styrene-type monomers in order to prepare polymers or copolymers having a pre-set molecular weight, which comprises carrying out the homopolymerization or copolymerization of said hydrocarbons in the presence of an alkali metal catalyst, such as lithium, and a modifier obtained by reacting an alkali metal with a conjugated hydrocarbon and an organoaluminum compound, the alkali metal-to-aluminum molar ratio in said modifier being 1:1.

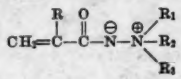
3,664,990

ACRYLIC AMINIMIDES AND POLYMERS THEREOF

Robert C. Siagel, Savage, Minn., assignor to Ashland Oil, Inc., Ashland, Ky.

Original application May 5, 1967, Ser. No. 636,273, now Patent No. 3,527,802, which is a continuation-in-part of application Ser. No. 514,705, Dec. 15, 1965, now abandoned. Divided and this application Mar. 20, 1970, Ser. No. 24,948
Int. Cl. C08f *3/00, 15/18, 15/22*
U.S. Cl. 260—85.5 R 10 Claims

"Acrylic" aminmides are prepared from "acrylic" acids or derivatives thereof. The "acrylic" aminimides can be homopolymerized and copolymerized to result in functional group-containing polymeric products capable of thermosetting. The "acrylic" aminimides have the general formula:



wherein R is a hydrogen, lower alkyl (C_1–C_6), aryl, chlorine, fluorine, bromine, or cyano group and R_1, R_2, and R_3 are hydrocarbon radicals and R_1 and R_2 can be combined to form a heterocyclic ring with the nitrogen.

3,664,991

VINYL-SUBSTITUTED PYRIMIDINES AND PURINES AND POLYMERS THEREOF

Howard Kaye, College Station, Tex., assignor to Research Corporation, New York, N.Y.

Filed Dec. 2, 1969, Ser. No. 881,595
Int. Cl. C08f *7/12*
U.S. Cl. 260—29.6 HN 7 Claims

Vinyl-substituted organic bases, particularly vinyl-substituted purines and vinyl-substituted pyrimidines and polymers thereof have been prepared. 1-vinyluracil was prepared by two methods. By one method 1,(2-chloroethyl) uracil was prepared by reacting bis (trimethylsilyl) uracil with 1,2-dichloroethane and then dehydrohalogenated. By the other method, B-ethoxy acryloyl chloride was converted into B-ethoxy acrylamide by treatment with ammonia. Vinylisocyanate was then heated with B-ethoxy acrylamide in a sealed tube to give N,B-ethoxy acryl-N-vinyl urea which was then cyclized to 1-vinyluracil. 9-vinyladenine was prepared directly by vinyl interchange of vinyl acetate with

adenine. A superior vinyl interchange procedure was developed. This procedure involves first protecting the 6-amino group with a benzoyl group. Each of the monomers, i.e. 1-vinyluracil and 9-vinyladenine, were polymerized in an aqueous solution by free radical catalysis and the resulting polymers exhibited good thermal properties and were capable of being cast into films.

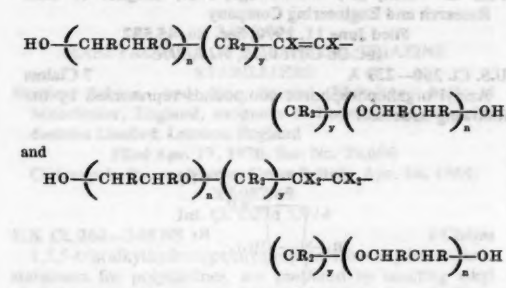
3,664,992

ACRYLIC ESTERS OF HALOGENATED ACETYLENIC DIOLS

Gaetano F. D'Alelio, 2011 East Cedar St., South Bend, Ind.

Filed Dec. 19, 1968, Ser. No. 785,337
Int. Cl. C08f 3/64, 3/66
U.S. Cl. 260—89.5 14 Claims

The esters disclosed herein comprise polymerizable acrylic esters of the halogenated acetylenic alcohols,



wherein R represents hydrogen preferably or a monovalent hydrocarbon containing one to 10 carbon atoms, X is a halogen selected from the class consisting of chlorine and bromine, *y* represents an integer having a value of 1 or 2, and one n represents zero and the other *n* represents an integer having a value of 0 to 3, preferably zero. These acrylic monomers are useful for the preparation of self-extinguishing homopolymers and copolymers; the diesters are also particularly useful as crosslinking agents for other monomers and polymers.

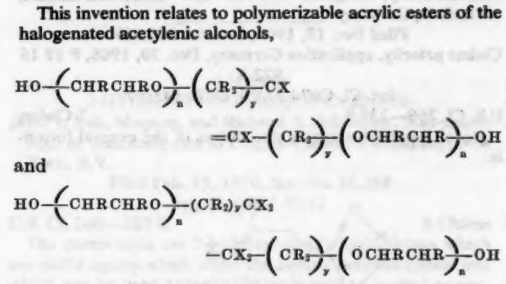
3,664,993

ACRYLIC ESTERS OF HALOGENATED ACETYLENIC DIOLS

Gaetano F. D'Alelio, 2011 East Cedar St., South Bend, Ind.

Filed Dec. 19, 1968, Ser. No. 785,338
Int. Cl. C08f 3/64, 3/66
U.S. Cl. 260—89.5 16 Claims

This invention relates to polymerizable acrylic esters of the halogenated acetylenic alcohols,



wherein R represents hydrogen and a monovalent hydrocarbon containing one to ten carbon atoms, X is a halogen selected from the class consisting of chlorine and bromine, *y* represents a numerical value of 1 or 2, and n represents a numerical value of 1 to 3. These acrylic monomers are useful for the preparation of self-extinguishing homopolymers and copolymers; the diesters are also particularly useful as crosslinking agents for other monomers and polymers.

3,664,994

PROCESS FOR SEPARATING HORSE GAMMA GLOBULIN FRACTIONS BY CHROMATOGRAPHY

Robert J. Perper, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed June 30, 1969, Ser. No. 837,416
Int. Cl. C07g 7/00
U.S. Cl. 260—112 B 3 Claims

Two gamma globulin fractions of differing chemical, immunological and biological characteristics are separated from an aqueous solution containing horse gamma globulin of antiheterologous lymphocyte or lymphoblast origin by fractionation on an anion exchanger ether of cross-linked dextran.

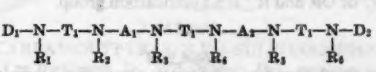
3,664,995

REACTIVE TRIAZINE CONTAINING DIAZO DYESTUFFS

Herbert Francis Andrew, and Neville Jackson, both of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Dec. 22, 1969, Ser. No. 887,329
Claims priority, application Great Britain, Dec. 31, 1968, 61,961/68
Int. Cl. C09b 62/08
U.S. Cl. 260—146 T 6 Claims

Dyestuffs of the formula:



in which D_1 and D_2 are azo, anthraquinone or nitro dye radicals, R_1–R_6 are H or lower alkyl groups, A_1 and A_2 are radicals of the benzene or naphthalene series and T_1 is a chloros-triazine radical, are reactive dyestuffs for cellulose having good fastness to light and washing. They are especially notable for the high proportion which reacts with the fiber when applied from saline dyebaths.

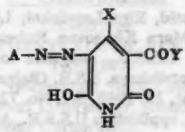
3,664,996

MONO AZO DYESTUFFS CONTAINING A PYRIDYL GROUP

Alistair Howard Berrie, and Nigel Hughes, both of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

Filed June 23, 1969, Ser. No. 835,749
Claims priority, application Great Britain, June 27, 1968, 30,760/68
Int. Cl. C09b 29/36
U.S. Cl. 260—156 2 Claims

Water-insoluble monoazo dyestuffs of the formula:



wherein A is optionally substituted aryl, X is hydrogen, optionally substituted aryl or alkyl optionally substituted by hydroxy, alkoxy or acyloxy, and Y is -R, -OR or $-NR^1R^2$, R being optionally substituted alkyl or aryl, and R^1 and R^2 each independently being hydrogen or optionally substituted alkyl or aryl, and the use of the dyestuffs for coloring synthetic polyester textile materials.

3,664,997
ROOM TEMPERATURE CURING ORGANOPOLYSILOXANE ELASTOMERS

Rajendra Nath Chadha, and Kailash Chandra Pande, both of Farmingdale, N.Y., assignors to Stauffer-Wacker Silicone Corporation, Adrian, Mich.

Continuation-in-part of application Ser. No. 676,090, Oct. 18, 1967, now abandoned. This application Mar. 9, 1970, Ser. No. 17,983
Int. Cl. C08h 9/00
U.S. Cl. 260—18 S 8 Claims

The invention relates to curable room temperature organopolysiloxanes comprising an organopolysiloxane and an organotin compound of the formula

wherein X is a group represented by hydrogen or

in which R and R′ are hydrocarbon groups, Y and Y′ are groups represented by hydrocarbon, hydroxyl, halogen, OOCR″ or OR and R″ is a hydrocarbon group.

3,664,998
PROCESS FOR CONVERTING PERACYLATED CIS-GLYCOSY HALIDES TO PERACYLATED TRANS-GLYCOSYL HALIDES AND NOVEL COMPOUNDS

Brian Bannister, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Nov. 3, 1969, Ser. No. 873,715
Int. Cl. C07c 47/18
U.S. Cl. 260—210 R 22 Claims

A peracylated cis-glycosyl halide is converted to the corresponding isothiouronium halide. The latter is decomposed to the corresponding mercaptan (β-anomer) which is concomitantly alkylated to the corresponding 1-thioglycoside. The latter is then converted to the trans-glycosyl halide by the reaction of halogen in an inert solvent. 6-Acylamino-6-deoxy-2,3,4-tri-0-acyl-α-D-galactopyranosyl bromide is in this way converted to the β-anomer.

The β-anomer is then converted to the 1-thio-α-glycoside by the thiourea process using a tertiary base dipolar aprotic solvent, the resulting 1-thio-α-glycoside deacylated, and the amino group reacylated to form antibacterially active 7,8-bisnorlincomycin or analog thereof.

3,664,999
METHOD FOR PRODUCTION OF CELLULOSE ION EXCHANGERS

Iosif Efimovich Khusid, Riga Latviiskoi; Ljudmila Ivanovna Bezgodova, and Mara Khugovna Ruben, both of Olaine Latviiskoi, all of U.S.S.R., assignors to Olainsky Zavod Khimreaktivov, Latviiskaya, S.S.R. Olaine, U.S.S.R.

Filed Apr. 22, 1968, Ser. No. 723,260
Claims priority, application U.S.S.R., Apr. 22, 1967, 1,150,438
Int. Cl. C08b 11/00
U.S. Cl. 260—231 A 5 Claims

A method for the manufacture of cellulose ion exchangers, such as carboxymethylcellulose, diethylaminoethylcellulose, and ECTEOLA-cellulose, by treating moist disintegrated cellulose with sodium hydroxide solution, etherifying the thus-mercerized cellulose, at an elevated temperature, and thereafter washing the product and dehydrating same with an organic solvent.

3,665,000
TRICARBOXYSTARCH DERIVATIVES

William A. Hills, Trenton, and Gert P. Volpp, Princeton, both of N.J., assignors to FMC Corporation, New York, N.Y.

Filed Dec. 23, 1969, Ser. No. 887,759
Int. Cl. C13l 1/08
U.S. Cl. 260—233.3 R 3 Claims

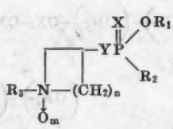
Tricarboxyl derivatives of starch and a process for their preparation which comprises directly oxidizing dialdehydestarch with dinitrogen tetroxide. The tricarboxyl derivatives function as polyelectrolyte builder materials and serve to enhance the cleaning capacity of conventional detergent compounds.

3,665,001
AZINYL ORGANOPHOSPHORUS COMPOUNDS

Paul L. Valint, Jr., Woodbridge, N.J., assignor to Esso Research and Engineering Company

Filed June 11, 1970, Ser. No. 45,582
Int. Cl. C07f 9/08, 9/12, 9/16
U.S. Cl. 260—239 A 7 Claims

Azinyl organophosphorus compounds represented by the following structure:



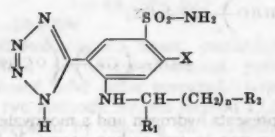
wherein R_1 is C_1–C_4 alkyl, R_2 is selected from C_1–C_4 alkyl optionally substituted by chlorine, bromine or alkoxy, C_1–C_4 thioalkyl, C_6–C_{10} aryl, C_1–C_4 alkoxy, phenoxy and thiophenoxy optionally substituted with chlorine, bromine or C_1–C_3 alkyl; R_3 can be hydrogen, C_1–C_4 alkyl, phenyl optionally substituted with chlorine, bromine or C_1–C_8 alkyl, C_6–C_{13} aralkyl, and C_5–C_6 cycloalkyl, X and Y can be O or S, m can be O or 1 and n is an integer ranging from 1 to 3. These compounds have been discovered to possess pesticidal activity, more particularly insecticidal activity.

3,665,002
5-PHENYL-TETRAZOLE DERIVATIVES

Alfred Popelak, Mannheim; Ansgar Lerch, Kirrlach/Baden; Kurt Stach, Mannheim-Waldhof; Egon Roesch, Lampertheim, and Klaus Hardebeck, Ludwigshafen/Rhine, all of Germany, assignors to Boehringer Mannheim GmbH, Postfach, Germany

Filed Dec. 18, 1969, Ser. No. 886,369
Claims priority, application Germany, Dec. 20, 1968, P 19 15 922.3
Int. Cl. C07d 57/00; C07c 143/80
U.S. Cl. 260—239.9 7 Claims

Novel 5-phenyl-tetrazole derivatives of the general formula:



wherein X is a halogen atom, an azido group or a trifluoromethyl radical, R_1 is a hydrogen atom or a lower alkyl radical, R_2 is a phenyl, furyl or thienyl radical and n is 0, 1 or 2; and the pharmacologically compatible salts thereof, possess exceptional diuretic and saluretic properties.

3,665,003

CEPHALOSPORIN COMPOUNDS

James Kennedy, South Harrow; Alan Gibson Long, Greenford, and William G. E. Underwood, Stoke Poges, all of England, assignors to Glaxo Laboratories Limited, Greenford, England

Filed Aug. 13, 1968, Ser. No. 752,191
Claims priority, application Great Britain, Aug. 21, 1967, 38,493/67
Int. Cl. C07d *99/24*
U.S. Cl. 260—243 C 12 Claims

7β-Acylamidoceph-3-em-4-carboxylic acids having an etherified 3-hydroxymethyl group, physiologically acceptable base or acid addition salts thereof and intermediates for the preparation of the acids and salts.

3,665,004

MANUFACTURE OF HEXAHYDROTRIAZINE STABILIZERS

Stanley Ashton, and Eric Samuel Nicholson, both of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Apr. 17, 1970, Ser. No. 29,696
Claims priority, application Great Britain, Apr. 24, 1969, 21,057/69
Int. Cl. C07d *55/14*
U.S. Cl. 260—248 NS 4 Claims

1,3,5-tris(alkylhydroxyphenylpropionyl)hexahydrotriazines stabilizers for polyolefines, are prepared by reacting alkyl phenols having a free *p*-position with 1,3,5-trisacryloylhexahydrotriazine in presence of an alkali metal catalyst in a polar solvent.

3,665,005

PROCESS FOR PREPARING 4-HYDROXY-6,7-SUBSTITUTED-3-CARBOALKOXYQUINOLINES

Nicholas D. Harris, Norwich, N.Y., assignor to Morton-Norwich Products, Inc.

Filed Dec. 22, 1969, Ser. No. 887,386
Int. Cl. C07d *33/48*
U.S. Cl. 260—287 R 1 Claim

4-Hydroxy-6,7-substituted-3-carboalkoxyquinolines, useful as coccidiostats, are readily prepared by refluxing a dimethyl sulfoxide solution of the corresponding 4-chloro compound.

3,665,006

2-HYDROXYBENZO[b]QUINOLIZINES

John T. Suh, Mequon, and Richard A. Schnettler, Milwaukee, both of Wis., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Feb. 10, 1970, Ser. No. 10,289
Int. Cl. C07d *39/12*
U.S. Cl. 260—289 R 8 Claims

The compounds are 2-hydroxybenzo[b]quinolizines which are useful agents which affect the central nervous system and which can be used as tranquilizing agents to control aggressive antisocial behavior in animals. The compounds may also be used as intermediates in the preparation of pickling agents, mothproofing agents and wood preservatives. Representative of the compounds disclosed are 8,9-dimethoxy - 2 - 2,3,4,6,11,11*a* - hexahydro - 1H - benzol[b]-quinolizine and 8,9 - dimethoxy - 2 - hydroxy - 2 - (3′ - trifluoromethylphenyl) - 2,3,4,6,11,11*a* - hexahydro - 1H - benzo[b]quinolizine.

3,665,007

THIAZOLO [3,4-A] BENZIMIDAZOLES AND DERIVATIVES THEREOF

Rudiger D. Haugwitz, Highland Park, and Venkatachala Lakshmi Narayanan, North Brunswick, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed May 4, 1970, Ser. No. 34,552
Int. Cl. C07d *99/06*
U.S. Cl. 260—306.7 7 Claims

1-Imino-1H,3H-thiazolo[3,4-a]benzimidazoles and 1H,3H-thiazolo[3,4-a]benzimidazole-3-ones are provided which are useful as parasiticides and rodenticides.

3,665,008

5-PYRAZOLYLTHIOPROPIONIC ACID DERIVATIVES

Leo Ralph Swett, and James Daniel Ratajczyk, both of Waukegan, Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Original application Apr. 1, 1968, Ser. No. 717,913, now Patent No. 3,590,048, dated June 29, 1971. Divided and this application June 17, 1970, Ser. No. 65,744
Int. Cl. C07d *49/18*
U.S. Cl. 260—310 R 4 Claims

1,3-Disubstituted-5,6-dihydrothiopyrano[2,3-c] pyrazoles are synthesized from the new 3-[(1,3-disubstituted-5-pyrazolyl)thio]propionic acids described. The new fused-ring compounds have excellent anti-inflammatory activity; they relieve edemas and are also useful as antipyretics and analgesics.

3,665,009

1-CARBAMOLYPYRAZOLE-4-SULFONAMIDES

Clifford Lee Dickinson, Jr., Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of application Ser. No. 764,940, Oct. 3, 1968, now abandoned. This application Aug. 18, 1969, Ser. No. 851,103
Int. Cl. C07d *49/02*
U.S. Cl. 260—310 2 Claims

Described are 1-carbamoylpyrazole-4-sulfonamides of the formula

in which X is acyclic

(R being alkyl, etc.), e.g.,

1-(dimethylcarbamoly)pyrazole-4-sulfonamide. The compounds, prepared by direct interaction between pyrazole-4-sulfonamide and the appropriate carbamoyl chloride, are anti-inflammatory agents.

3,665,010

SUBSTITUTED PHENYLACETIC ACIDS AND ESTERS THEREOF

Rolf Denss, Basel, Switzerland; Niels Clauson-Kaas, Farum, Denmark, and Franz Ostermayer, Riehen, Switzerland, assignors to Ciba-Geigy Corporation

Original application Oct. 30, 1967, Ser. No. 679,224, now Patent No. 3,579,535. Divided and this application Apr. 29, 1970, Ser. No. 43,650
Claims priority, application Switzerland, Oct. 31, 1966, 15,768/66; Jan. 31, 1967, 713/67; Aug. 7, 1967, 11,178/67
Int. Cl. C07d *27/26*
U.S. Cl. 260—326.3 3 Claims

Substituted phenyl acetic acids, addition salts thereof with bases as well as esters thereof, which compounds exhibit use-

ful antiinflammatory (antiphlogistic), analgesic and antipyretic activity, and processes for the production of these compounds, as well as starting materials used in said processes; therapeutic compositions containing these compounds, and methods of treatment, particularly methods of inducing antiinflammatory, analgesic and antipyretic effects in mammals. Illustrative embodiments are 2-[p-(1-pyrryl)-phenyl]-butyric acid, [3-chloro-4-(1-pyrryl)-phenyl]-acetic acid and 2-[p-(1-pyrryl)-phenyl]-propionic acid methyl ester.

3,665,011

SUBSTITUTED PHENYLACETIC ACIDS AND ESTERS THEREOF

Rolf Denss, Basel, Switzerland; Niels Clauson-Kaas, Farum, Denmark, and Franz Ostermayer, Riehen, Switzerland, assignors to Ciba-Geigy Corporation

Original application Oct. 30, 1967, Ser. No. 679,224, now Patent No. 3,579,535. Divided and this application Apr. 29, 1970, Ser. No. 43,648

Claims priority, application Switzerland, Oct. 31, 1966, 15,768/66; Jan. 31, 1967, 713/67; Aug. 7, 1967, 11,178/67

Int. Cl. C07d *27/26*

U.S. Cl. 260—326.3 **2 Claims**

Substituted phenyl acetic acids, addition salts thereof with bases as well as esters thereof, which compounds exhibit useful antiinflammatory (antiphlogistic), analgesic and antipyretic activity, and processes for the production of these compounds, as well as starting materials used in said processes; therapeutic compositions containing these compounds, and methods of treatment, particularly methods of inducing antiinflammatory, analgesic and antipyretic effects in mammals. Illustrative embodiments are 2-[p-(1-pyrryl)-phenyl]-butyric acid, [3-chloro-4-(1-pyrryl)-phenyl]-acetic acid and 2-[p-(1-pyrryl)-phenyl]-propionic acid methyl ester.

3,665,012

1-SUBSTITUTED-2-IMINOPYRROLIDINES, INTERMEDIATES THEREFOR AND PROCESSES FOR THE PREPARATION THEREOF

Hermann Bretschneider; Wilhelm Klotzer, and Rudolf Franzmair, all of Innsbruck, Austria, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Aug. 1, 1969, Ser. No. 846,916

Claims priority, application Switzerland, Aug. 7, 1968, 11,854/68

Int. Cl. C07d *27/04*

U.S. Cl. 260—326.3 **13 Claims**

Novel 2-iminopyrrolidines substituted in the 1-position are prepared from 2-amino-Δ′-pyrrolines. The novel pyrrolidines are useful as anti-diabetic and hypoglycemic agents since they effect a lowering of the blood sugar content in warm blooded animals.

3,665,013

PRODUCTION OF COUMARIN DERIVATIVES BY A CONTINUOUS METHOD

Colin Fitzmaurice, Holmes Chapel, and Robert Minshull, Brereton, both of England, assignors to Fisons Pharmaceuticals Limited, Loughborough, England

Filed Dec. 22, 1967, Ser. No. 692,812

Claims priority, application Great Britain, Dec. 22, 1966, 57,534/66

Int. Cl. C07d *7/28*

U.S. Cl. 260—343.2 R **13 Claims**

The known Fries rearrangement reaction used for the preparation of 4-alkyl, aryl or aralkyl-7-hydroxy-8-acyl coumarins from corresponding 4-alkyl, aryl or aralkyl-7-acyloxy coumarins is effected in a continuous manner using apparatus in which a thin film of the molten reaction mixture is moved continuously over a heated surface. The customary Fries catalyst is preferably mixed with another thermally stable salt so that its melting point may be lowered.

3,665,014

2-SUBSTITUTED 4-PROPARGYLOXYMETHYL-2-ETHOXY-CARBONYL-γ-BUTYROLACTONES

Claude P. Fauran; Guy M. Raynaud, both of Paris; Bernard M. Pourrias, Meudon, and Colette A. Douzon, Paris, all of France, assignors to Delande S.A.

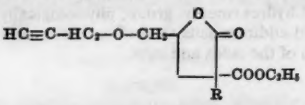
Filed Aug. 21, 1969, Ser. No. 852,086

Claims priority, application Great Britain, Sept. 17, 1968, 44,026/68

Int. Cl. C07d *5/06*

U.S. Cl. 260—343.6 **5 Claims**

A compound of the formula



in which R is a saturated or unsaturated, straight or branched chain aliphatic hydrocarbon radical having one–10 carbon atoms or an aryl aliphatic radical, in which the aryl may be substituted by one or more halogen atoms, one or more alkoxy radicals or a trifluoromethyl radical. The compound is prepared by reacting, in the presence of sodium ethylate, (1) 4-propargyloxymethyl-2-ethoxycarbonyl-γ-butyrolactone with (2) XR, wherein R has the same meaning as above and X is halogen. The compounds possess respiratory stimulating, analgesic and hypotensive properties.

3,665,015

PROCESS FOR PREPARING 3-HYDROXY-2-METHYL-4-PYRONE

Itaru Takasu; Masaru Higuchi, and Hiroshi Hotta, all of Ohimachi, Japan, assignors to Daicel Ltd., Osaka, Japan

Filed Oct. 6, 1969, Ser. No. 864,166

Claims priority, application Japan, Oct. 12, 1968, 43/74342

Int. Cl. C07d *7/16*

U.S. Cl. 260—345.9 **6 Claims**

3-hydroxy-2-methyl-4-pyrone (maltol) is prepared by (1) reacting β, δ-dioxocaproaldehyde dialkyl acetal with lead tetraacetate, (2) either (a) pyrolyzing the product of step (1), or (b) treating the same with an acid condensing agent, and (3) hydrolyzing the product of step (2) either simultaneously therewith or subsequently.

β, δ-dioxocaproaldehyde is prepared by reacting lower alkyl ββ-dialkoxypropionates with acetone under conditions suitable to effect the Claisen condensation reaction.

3,665,016

AMINOALKYLTHIO INDOLES

Jacques Bourdais, Paris, France, assignor to Centre National De La Recherche Scientifique, Paris, France

Filed Oct. 3, 1968, Ser. No. 764,933

Claims priority, application France, Oct. 5, 1967, 123429; Sept. 26, 1968, 167763

Int. Cl. C07d *51/70*

U.S. Cl. 260—268 BC **15 Claims**

A class of amino alkyl thioethers of 2-mercapto indole is described together with methods for their manufacture from indoline-2-thione starting materials, reacted with amine or aziridine. The compounds are of therapeutic value as pain relievers, tranquillizers and other purposes.

3,665,017

PROCESS FOR PREPARATION OF 6-AZIDO-4, 6-BIS-DEHYDRO-STEROIDS

George J. Teutsch, Nancy, France, and Elliot L. Shapiro, Cedar Grove, N.J., assignors to Schering Corporation, Bloomfield, N.J.

Filed July 24, 1970, Ser. No. 58,162

Int. Cl. C07c *173/00*

U.S. Cl. 260—349 **10 Claims**

6-Azido-4,6-bis-dehydro-steroids are prepared by treating a 6β-azido-7α-acyloxy-4-dehydro-steroid which is saturated

at C–1 and C–2, with a tetraalkylammonium halide in an aprotic solvent.

Preferred species include the preparation of 6-azido-4,6-pregnadienes of the corticoid and progesterone series by treatment of a 6β-azido-7α-acyloxy-4-pregene of the corticoid or progesterone series which is saturated at C–1 and at C–2 and wherein said 7α-acyloxy is a member selected from the group consisting of 7α-lower alkanoyloxy and 7α-hydrocarbonsulfonyloxy having up to seven carbon atoms with a tetraalkylammonium halide in an aprotic solvent.

6-Azido-6-dehydrocortisone acetate having enhanced anti-inflammatory activity is prepared by treating a member selected from the group consisting of 6β-azido-7αacetoxy-4-pregnene-17α,21-diol-3,11,20-trione 21-acetate and 6β-azido-7αmethanesulfonyloxy-4-pregnene-17α,21-diol-3,11,20-trione 21-acetate with tetramethylammonium-fluoride in acetonitrile.

3,665,018

NAPHTHACENE DERIVATIVES

Georges Jolles, Sceaux, France, assignor to Rhone-Poulenc S.A., Paris, France

Filed July 14, 1969, Ser. No. 841,552

Claims priority, application France, July 15, 1968, 159237; June 2, 1969, 6918032

Int. Cl. C07c *87/10, 87/36*

U.S. Cl. 260—365 **11 Claims**

New derivatives of 4-methoxy-5,12-dioxo-6,9,11-trihydroxy-9-acetyl-5,7,8,9,10,12-hexahydronaphthacene with a substituent —O—CO—R in the 7-position, wherein R represents cyclohexyl substituted by an aminomethyl group, or by at least one amino group, monoalkylamino group of which the alkyl radical contains one to five carbon atoms, dialkylamino group of which each alkyl radical contains one to five carbon atoms, or sulphomethylamino group, or R represents a said substituted-cyclohexyl group also substituted by at least one hydroxy group or alkanoyloxy group of which the alkanoyl radical contains one to five carbon atoms, or R represents a phenylalkyl group of which the alkyl radical contains one to four carbon atoms and is substituted by a bis(2-chlorethyl)amino group, or a piperidyl group, and non-toxic salts thereof, have useful properties against leukaemia L1210 in mice, combined with a low toxicity.

3,665,019

ANTHRAQUINONE DYESTUFFS

Josef Singer, Leverkusen, Germany, assignor to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

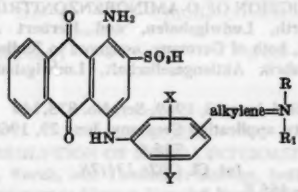
Continuation of application Ser. No. 607,885, Jan. 9, 1967, now abandoned. This application Feb. 24, 1970, Ser. No. 14,724

Claims priority, application Germany, Jan. 18, 1966, F 48195; Nov. 25, 1966, F 50764

Int. Cl. C09b *1/34*

U.S. Cl. 260—374 **4 Claims**

Anthraquinone dyestuffs suitable for dyeing natural and synthetic polypeptide fibers, such as silk and polyamide fibers, are provided of the formula:



wherein X and Y are hydrogen, halogen, methyl, ethyl, methoxy, or ethoxy; R is hydrogen, methyl or ethyl; and R_1 is phenylsulfonyl or substituted phenylsulfonyl.

3,665,020

PROCESS FOR THE PREPARATION OF CRYSTALLINE VITAMIN D_3

Roman Marbet, Riehen, Switzerland, assignor to Hoffman-La Roche Inc., Nutley, N.J.

Filed Feb. 18, 1970, Ser. No. 12,459

Claims priority, application Switzerland, Feb. 25, 1969, 2804/69

Int. Cl. C07c *171/10*

U.S. Cl. 260—397.2 **6 Claims**

The invention comprises the preparation of crystalline vitamin D_3 from a vitamin D_3 resin by dissolving a vitamin D_3 resin in methyl formate and cooling the resultant solution.

3,665,021

9α-UNSUBSTITUTED-11β-CHLORO-L9 NOS-STEROIDS

Joseph Elks, London; Gordon Hanley Phillipps, Greenford, and Alan Tulley, Formby, all of England, assignors to Glaxo Laboratories Limited, Greenford, England

Continuation-in-part of application Ser. No. 701,064, Jan. 29, 1968, now abandoned. This application Aug. 1, 1969, Ser. No. 846,975

Int. Cl. C07c *169/32*

U.S. Cl. 260—397.45 **34 Claims**

9α-Unsubstituted 11β-chloro-19-nor-steroids are provided as new compounds having hormonal activity and, in particular, progesterone-like or anabolic/androgenic activity.

3,665,022

DEGRADATION OF SIDE CHAIN IN SAPOGENINS

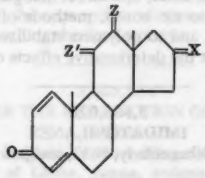
Eiji Kondo, Ikeda-shi, Osaka, and Takashi Mitsugi, Senbokugun, Osaka, both of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Continuation-in-part of application Ser. No. 597,216, Nov. 28, 1966, now abandoned. This application Sept. 2, 1969, Ser. No. 854,769

Int. Cl. C07c *169/20*

U.S. Cl. 260—397.3 **18 Claims**

Compounds of the formula



wherein X is oxo, lower alkylenedioxy, di(lower alkoxy), or

in which R' is hydrogen or acyl; one of Z and Z' is oxo or

in which R is hydrogen or acyl, and the other is

and the dotted line represents the presence or absence of a double bond are useful as intermediates for preparing a wide variety of androstranes and estranes, including testosterone, esterone, estradiol, etc., in per se known manner.

3,665,023

N-(4-NITROPHENYLSULFONYL)-N'-(CHLORO AND/OR NITRO SUBSTITUTED BENZOYL)UREAS

Angelo Speziale, Creve Coeur, and Lowell R. Smith, Chesterfield, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Original application June 17, 1968, Ser. No. 737,344, now Patent No. 3,547,618, dated Dec. 15, 1970. Divided and this application Mar. 27, 1970, Ser. No. 29,722

Int. Cl. C07c 143/78

U.S. Cl. 260—397.7 D 4 Claims

Compounds of the class N-(4-nitrophenylsulfonyl)-N'-(chloro and/or nitro substituted benzoyl) ureas which compounds are phytocidally active.

3,665,024

DIALKYLTIN BIS(SUBSTITUTED MERCAPTIDES)

Vincent Oakes, St. Helens, and Brian Rodney Iles, Liverpool, both of England, assignors to Pure Chemicals Limited, Liverpool, England

Filed Nov. 18, 1969, Ser. No. 877,857

Claims priority, application Great Britain, Nov. 22, 1968, 55,523/68

Int. Cl. C07f 7/22

U.S. Cl. 260—429.7 3 Claims

New organotin compounds, suitable for use as stabilizers for vinyl halide resins, are obtained by reacting a dialkyltin oxide, hydroxide, or dihalide with a monoester of a diol or an alkoxy or acyloxy alcohol with a mercapto-acid.

3,665,025

ORGANO(HALO) DISULFUR TIN DERIVATIVES AND THE PROCESS OF PREPARING THE SAME

Anatole Wowk, Edison, N.J., assignor to M & T Chemicals Inc., New York, N.Y.

Filed Dec. 29, 1969, Ser. No. 888,850

Int. Cl. C07f 7/22

U.S. Cl. 260—429.7 18 Claims

This invention comprises novel compounds exhibiting one direct carbon to tin bond, one direct halogen to tin bond and two direct sulfur to tin bonds, methods of preparing these novel compounds, and to polymers stabilized by these novel compounds against the deteriorative effects of heat and light.

3,665,026

IMIDATOSILANES

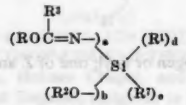
Milton L. Evans, Schenectady, N.Y., assignor to General Electric Company

Filed Mar. 14, 1969, Ser. No. 807,436

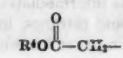
Int. Cl. C07f 7/02, 7/04

U.S. Cl. 260—448.8 R 16 Claims

Compound of the formula:



wherein R^1 and R^7 are each organic radicals of not more than 18 carbon atoms selected from the group consisting of hydrogen, hydrocarbyl, halohydrocarbyl and cyanoalkyl, R and R^2 are each organic radicals of not more than 18 carbon atoms selected from the group consisting of hydrocarbyl, halohydrocarbyl, nitrohydrocarbyl and alkoxyhydrocarbyl, R^3 is an organic radical of not more than 18 carbon atoms selected from the group consisting of hydrogen, hydrocarbyl, halohydrocarbyl, nitrohydrocarbyl, alkoxyhydrocarbyl, dialkylamino and



wherein R^4 is an organic radical selected from the group consisting of aliphatic hydrocarbyl, aliphatic halohydrocarbyl, aliphatic nitrohydrocarbyl, and

wherein R^5 and R^6 are each aliphatic hydrocarbyl, *a* is an integer of 1 to 4, inclusive, *b* is an integer of 0 to 3, inclusive, *d* and *e* are each integers of 0 to 1, and the sum of *a*, *b*, *d* and *e* is 4. The imidatosilanes are useful as chain extenders and as curing agents in one-package RTV compositions.

3,665,027

PROCESS FOR PREPARING GAMMA-AMINOPROPYLALKOXY-SILANES AND GAMMA-AMINOPROPYLALKYLALKOXYSILANES

Sigrid Reichel, Dresden, Germany, assignor to Institut fur Silikon- und Fluorkarbon-Chemie, Radebeul, Germany

Filed July 23, 1969, Ser. No. 844,189

Int. Cl. C07f 7/04, 7/02

U.S. Cl. 260—448.8 R 8 Claims

A process for preparing gamma-aminopropylalkoxysilanes and gamma-aminopropylalkylalkoxysilanes by an addition of allylamine to hydrogenalkoxysilanes or hydrogenalkylalkoxysilanes, which comprises boiling the components under reflux, in the presence of a catalyst known for addition reactions, until the temperature of the reaction mixture reaches a constant level above 110° C. The time required is from 30 to 40 hours. The peroxysilanes formed simultaneously with the gamma-aminopropylalkoxysilanes and gamma-aminorpopylalkylalkoxysilanes can be removed by vacuum distillation, as first runs. The residue is then a useful adhesion-promoting agent for glass fiber-reinforced synthetics. Other uses for the gamma-aminopropylalkoxysilanes and gamma-aminopropylalkylalkoxysilanes of this invention are: surface treating of textiles, leather, ceramics, glass; corrosion protection of metals, use as primers and adhesives and for modifying synthetics.

3,665,028

PROCESS FOR PREPARATION OF BORATE ESTERS

Joseph L. Russell, Ridgewood, N.J., assignor to Halcon International, Inc., New York, N.Y.

Continuation-in-part of application Ser. No. 593,646, Nov. 14, 1966, now abandoned. This application Mar. 6, 1968, Ser. No. 710,781

Int. Cl. C07f 5/04

U.S. Cl. 260—462 A 11 Claims

This invention relates to the oxidation of hydrocarbons in the presence of boron compounds. More specifically, the invention teaches a method of improving the selectivity of the reaction and the distribution of the oxidation products.

3,665,029

PRODUCTION OF O-AMINOBENZONITRILES

Helmut Goerth, Ludwigshafen, and Herbert Armbrust, Gruenstadt, both of Germany, assignors to Badische Anilin & Soda-Fabrik Aktiengesellschaft, Ludwigshafen/Rhine, Germany

Filed June 23, 1969, Ser. No. 835,744

Claims priority, application Germany, June 29, 1968, P 17 68 786.4

Int. Cl. C07c 121/78

U.S. Cl. 260—465 E 8 Claims

Production of o-aminobenzonitriles by thermal decomposition of isatin β-oximes in the presence of basic compounds. The new products are starting materials for the production of dyes and pesticides.

3,665,030

OXIDATION OF ALKYL AROMATICS

Pierre de Radzitzky d'Ostrowick, and Jacques D. V. Henotier, both of Brussels, Belgium, assignors to Labofina, Soc. An., Brussels, Belgium

Filed Dec. 11, 1969, Ser. No. 884,336
Int. Cl. C07c *47/54, 63/02, 69/14*
U.S. Cl. 260—488 CD 25 Claims

Process of liquid phase oxidation of the alpha carbon atom of alkylbenzenes by a manganic or cobaltic salt and an acid activator with or without an oxidation-resistant solvent either in an inert atmosphere to produce lower oxidation products of the alpha carbon atom such as alcohols or their esters; or, in the presence of molecular oxygen, to produce higher oxidation products such as aromatic aldehydes, ketones or carboxylic acids.

3,665,031

WATER-SOLUBLE PHENOLIC ANTIOXIDANTS

Hans Jakob Peterli; Ernst Keller, both of Baseland, and Kurt Schwarzenbach, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Sept. 16, 1968, Ser. No. 762,374
Claims priority, application Switzerland, Sept. 20, 1967, 13164/67
Int. Cl. C07c *143/52*
U.S. Cl. 260—507 R 14 Claims

Water-soluble compounds of the general formula

$$(A-Y-)_nZ(SO_3^-M^+)_m$$

wherein

A represents the radical of a sterically hindered phenol of the benzene series.

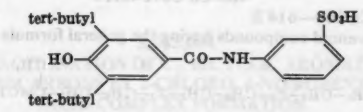
Y represents a bridge wherein the acyclic bridging member contains a carboxylic acid amide group as chain member,

Z represents an aliphatic radical or a carboxyclic aromatic radical, containing at most two mono- or bi-cyclic nuclei,

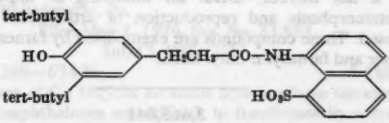
M^+ represents one equivalent of a cation solvatizable by water, and

m and *n* independently of each other represent 1 or 2, and their water soluble salts are disclosed as antioxidants useful for the stabilization of organic polymers containing basic groups against deterioration due to heat and/or oxygen. In contrast to known stabilizing agents, the novel compounds need not be incorporated into the polymerization or polycondensation process for producing the materials to be protected or into a melt of such materials but can be applied to the finished organic products in an after-treatment, for instance by drawing thereon from an aqueous bath.

Typical compounds of the invention are those of the formulas



and



3,665,032

RESOLUTION OF L-DOPA INTERMEDIATE

Homer A. Burch, and Thomas J. Schwan, both of Norwich, N.Y., assignors to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Apr. 10, 1970, Ser. No. 27,438
Int. Cl. C07c *101/08*
U.S. Cl. 260—519 1 Claim

A process is provided whereby DL-α-benzoylamino-4-hydroxy-3-methoxydihydrocinnamic acid is reacted with dehydroabietylamine to form the amine salt of Lα-benzoylamino-4-hydroxy-3-methoxydihydrocinnamic acid which upon treatment with hydrochloric acid and hydrobromic acid yields L-Dopa.

3,665,033

METHOD FOR COOLING THE REACTOR EFFLUENT FROM THE OXIDATION OF META-OR PARA-XYLENE

Stanley Ohlswager, Olympia Fields, Ill., assignor to Atlantic Richfield Company, New York, N.Y.

Continuation-in-part of application Ser. No. 727,977, May 9, 1968, now abandoned. This application July 1, 1970, Ser. No. 51,516
Int. Cl. C07c *63/02*
U.S. Cl. 260—524 R 8 Claims

A high temperature liquid stream containing dissolved solids which tend to deposit on heat exchange surfaces is combined and quenched with a low temperature recycle stream which is a portion of the feed stream to provide a mixture of intermediate temperature. Low temperature in the quench stream and removal of heat from the system are achieved by cooling the mixture of intermediate temperature at a relatively low temperature level and high mass velocity in a heat exchanger without substantial deposition of solids on exchange surfaces. The process is particularly effective in cooling the reactor effluent from the oxidation of meta- or para-xylene to isophthalic or terephthalic acid wherein the reactor effluent, comprising a saturated slurry of the acid product in an acetic acid medium, is at a temperature of at least about 200° F., and is combined with a quench stream of cooled product slurry. The amount and temperature of the quench stream are proportioned to give a composite stream of an intermediate temperature suitable for recycle to the oxidation reactor for temperature control and for product recovery by filtration. The quench stream is provided by diverting a non-supersaturated portion of the composite stream, in appropriate amount, through a heat exchanger operated at a relatively low temperature level and a linear velocity of about 5 to 15, and preferably 10 to 12, feet per second, to attain the appropriate temperature, of up to about 120° F., for quenching the feed stream.

3,665,034

PROCESS FOR THE PRODUCTION OF CARBOXYLIC ACIDS

Youji Komatsu; Takeshi Tamura; Kinya Kujii, and Masafumi Hatsutori, all of Chiba, Japan, assignors to Maruzen Oil Company Limited, Osaka, Japan

Filed Apr. 25, 1969, Ser. No. 819,458
Claims priority, application Japan, Apr. 25, 1968, 43/27872; July 20, 1968, 43/51473
Int. Cl. C07c *51/14*
U.S. Cl. 260—533 A 22 Claims

A process for the production of a carboxylic acid at a high yield with reduced formation of by-products, which comprises reacting an olefin, a halogenated olefin, an alcohol, a halohydrin, an ester, an ether or a mercaptan with carbon monoxide using an acidic catalyst in the presence of a halogenated hydrocarbon and/or a carboxyl group-containing compound and diluting the resulting reaction mixture with water.

3,665,035

ACRYLIC COMPOSITION FOR WATER TREATMENT AND PROCESS FOR MAKING SAME

Herbert L. Rice; Arthur Cizek, and Marvin O. Thaemar, all of Houston, Tex., assignors to Milchem Incorporated, Houston, Tex.

Filed Aug. 18, 1969, Ser. No. 851,085
Int. Cl. C07c *153/00*
U.S. Cl. 260—537 S 10 Claims

This invention relates to an acrylic composition; a process for obtaining the acrylic composition; to the use of such com-

position to remove and/or inhibit scale formation in water treatment apparatuses, oil and gas wells, producing formations, and other scale containing or attracting surfaces. Said novel composition is formed from about 80 to 90 parts by weight acrylic acid, about 7 to 15 parts by weight thioglycolic acid, and about 1.5 to 5 parts by weight ammonium persulfate.

3,665,036

DYE FORMING NITROPARAPHENYLENEDIAMINE SULFONYL DERIVATIVES

Gregoire Kalopissis, Paris, and Andree Bugaut, Boulogne sur Seine, both of France, assignors to Societe anonyme dite: L'Oreal, Paris, France

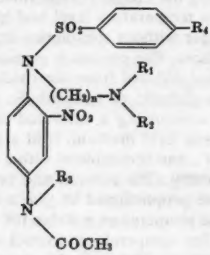
Continuation-in-part of application Ser. No. 568,118, July 27, 1966, now abandoned. This application Feb. 9, 1970, Ser. No. 10,040

Int. Cl. C07c *143/78*

Claims priority, application Luxembourg, July 30, 1965, 49.214; Jan. 27, 1966, 50.348; July 4, 1966, 51.474

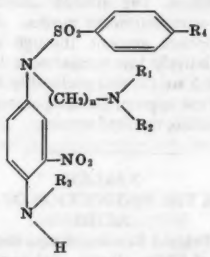
U.S. Cl. 260—556 AR **5 Claims**

Intermediate compounds which can be used to form hair dyes which have the formula:



(III)

and



(IV)

in which R_1 and R_2 are H, alkyl or hydroxyalkyl and may form a heterocyclic ring with the N atom, R_3 is H, alkyl or hydroxyalkyl, R_4 is H or CH_3 and n is 2–6.

3,665,037

4-METHYLCYLOHEXYLHYDROXY AMINE

Masuo Murakami, Tokyo; Masaru Iwanami, Kanagawa-ken; Kazuo Kubo; Kenji Sano, both of Saitama-ken; Masahiro Kochiya, and Hideki Arima, both of Tokyo, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

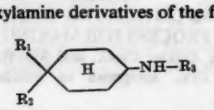
Filed June 27, 1969, Ser. No. 837,330

Claims priority, application Japan, July 6, 1968, 43/46816; July 19, 1968, 43/50579

Int. Cl. C07c *83/02*

U.S. Cl. 260—563 R **1 Claim**

Novel cyclohexylamine derivatives of the formula



wherein R_1 represents a lower alkyl group, R_2 represents a hydrogen atom or a lower alkyl group, and R_3 represents a hydrogen atom or a hydroxyl group, said R_3 being a hydrogen atom when the R_2 is a lower alkyl group and a hydroxyl group when the R_2 is a hydrogen atom. These derivatives are excellent as analgesics.

3,665,038

PROCESS FOR PREPARING CARBON-CARBON COUPLED DIMERS OF N-ARYLNAPHTHYLAMINES

Robert F. Bridger, Hopewell, N.J., assignor to Mobil Oil Corporation

Filed June 12, 1969, Ser. No. 832,859

Int. Cl. C07c *87/64, 87/66*

U.S. Cl. 260—576 **7 Claims**

Carbon-carbon coupled dimers of N-arylnaphthylamines are prepared by thermally decomposing an N-nitroso-N-arylnaphthylamine. The aryl portion of such material may be phenyl, naphthyl or an alkyl-, alkoxy- or halogen-substituted member of these.

The compounds thus produced are useful as antioxidants for a variety of organic materials. These include polyurethane and polyolefin polymers as well as lubricating oils.

3,665,039

UNSATURATED ALDEHYDES

Rudolf Ruegg, Bottmingen, and Ulrich Schwieter, Reinach, Basel-Land, both of Switzerland, assignors to Hoffman-La Roche Inc., Nutley, N.J.

Original application Nov. 12, 1963, Ser. No. 323,156, now Patent No. 3,466,335, dated Sept. 9, 1968. Divided and this application Mar. 19, 1969, Ser. No. 808,664

Int. Cl. C07c *47/20*

U.S. Cl. 260—602 **2 Claims**

Unsaturated aldehydes which are intermediates in the preparation of carotenoids.

3,665,040

PESTICIDES

Rudolf Ruegg, Bottmingen, Switzerland, and Peter Schmialek, Berlin-Dahlem, Germany, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

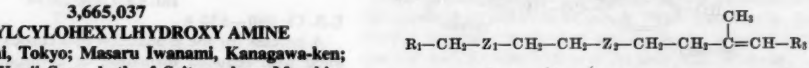
Original application Jan. 11, 1968, Ser. No. 696,987, now Patent No. 3,541,154, which is a division of application Ser. No. 301,968, Aug. 14, 1963, now Patent No. 3,429,970, which is a continuation-in-part of application Ser. No. 168,834, Jan. 25, 1962, now abandoned , and 196,521, May 21, 1962, now abandoned. Divided and this application May 19, 1970, Ser. No. 38,915

Claims priority, application Germany, Feb. 2, 1961, Sch 29159; Switzerland, May 24, 1961, 6019/61

Int. Cl. C07c *43/14*

U.S. Cl. 260—614 R **2 Claims**

Isoprenoid compounds having the general formula



or a salt thereof, useful for hindering or impeding the metamorphosis and reproduction of arthropodes are disclosed. These compounds are exemplified by farnesyl methyl ether and farnesyl-n-butyl ether.

3,665,041

PERFLUORINATED POLYETHERS AND PROCESS FOR THEIR PREPARATION

Dario Sianesi, Milan, and Renzo Fontanelli, Rome, both of Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

Filed Apr. 2, 1968, Ser. No. 718,223

Claims priority, application Italy, Apr. 4, 1967, 14508 A/67

Int. Cl. C07c *43/30*

U.S. Cl. 260—615 A **8 Claims**

New polyether oligomers, homopolymers and copolymers consisting only of carbon, fluorine and oxygen atoms, having

only perfluoralkyl terminal groups, and containing no peroxidic oxygen. Prepared by reacting polyether which contains reactive terminal groups and, optionally, peroxidic oxygen with fluorine gas under pressures between about 0.2 and 10 atmospheres and at temperatures between about 100° and 350° C.

3,665,042

PROCESS FOR 4-ALKYL-2,6-DINITROCHLOROBENZENES

Eddie V. P. Tao, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed May 22, 1970, Ser. No. 39,876
Int. Cl. C07c *79/12*
U.S. Cl. 260—646 **3 Claims**

4-Isopropyl-2,6-dinitrochlorobenzene and 4-tert-butyl-2,6-dinitrochlorobenzene are prepared in high yields via chlorination of the corresponding 2,6-dinitro phenols with thionyl chloride in the presence of dimethylformamide and a C_6-C_{10} alkyl hydrocarbon solvent. The 4-alkyl-2,6-dinitrochlorobenzenes obtained thereby are useful intermediates of the herbicidally active dinitroanilines.

3,665,043

FRACTIONATION OF C_{12} BICYCLIC AROMATIC HYDROCARBONS BY DI OR TRIANHYDRIDE COMPLEX FORMATION

Ronald I. Davis, Wilmington, Del., and Kenneth A. Scott, Swarthmore, Pa., assignors to Sun Oil Company, Philadelphia, Pa.

Filed May 1, 1970, Ser. No. 33,981
Int. Cl. C07c *7/00*
U.S. Cl. 260—674 N **11 Claims**

Mixtures of C_{12} bicyclic aromatic hydrocarbons containing dimethylnaphthalenes are difficult to fractionate by conventional techniques such as distillation or crystallization. However, by contacting such mixtures with the dianhydride of 1,2,4,5-benzenetetracarboxylic acid, the dianhydride of 1,2,3,4-benzenetetracarboxylic acid or the trianhydride of 1,2,3,4,5,6,-benzenehexacarboxylic acid, a solid complex of certain hydrocarbons and the polyanhydride is formed. Separation of the solid complex and its subsequent decomposition results in a complexate that is substantially richer in those dimethylnaphthalenes which are preferentially complexed. Upon further processing these dimethylnaphthalenes have utility in the production of dyes.

3,665,044

FRACTIONATION OF C_{12} BICYCLIC AROMATIC HYDROCARBONS BY 2-CHLORO, 4-NITROBENZOIC ACID COMPLEX FORMATION

Kenneth A. Scott, Swarthmore, Pa., assignor to Sun Oil Company, Philadelphia, Pa.

Filed May 1, 1970, Ser. No. 33,951
Int. Cl. C07c *7/00*
U.S. Cl. 260—674 N **5 Claims**

Mixtures of C_{12} bicyclic aromatic hydrocarbons containing dimethylnaphthalenes are difficult to fractionate by conventional techniques such as distillation or crystallization. However, by dissolving 2-chloro, 4-nitrobenzoic acid in such a mixture at an elevated temperature, followed by subsequent cooling, a solid complex of said acid and certain hydrocarbons is formed. Separation of the solid complex from the cooled mixture and its subsequent decomposition results in a product that is substantially richer in those dimethylnaphthalenes which have greater tendency to form such complexes. Upon further processing, these dimethylnaphthalenes have utility in the production of dyes.

3,665,045

FRACTIONATION OF EUTECTIC MIXTURES OF DIMETHYLNAPTHALENES BY DIANHYDRIDE COMPLEXATION

Ronald I. Davis, Wilmington, Del., and Kenneth A. Scott, Swarthmore, Pa., assignors to Sun Oil Company, Philadelphia, Pa.

Filed May 1, 1970, Ser. No. 33,980
Int. Cl. C07c *7/00*
U.S. Cl. 260—674 N **9 Claims**

Binary eutectics of dimethylnapthalenes having each methyl group at a β position cannot be fractionated by crystallization and are difficult to fractionate by distillation. However, by dissolving the normally solid eutectic in an inert solvent and contacting the resulting solution with a dianhydride of 1,2,4,5,-benzenetetracarboxylic acid or a dianhydride of 1,2,3,4-benzenetetracarboxylic acid, a solid complex is formed. Separation of the solid complex and its subsequent decomposition results in a complexate that is substantially richer in a dimethylnapthalene which is preferentially complexed. Dimethylnaphthalenes are oxidized to naphthalenecarboxylic acids which are used in the production of dyes and pigments.

3,665,046

SEPARATION OF PARA-XYLENE FROM MIXTURES OF C_8 AROMATICS UTILIZING CRYSTALLINE ALUMINOSILICATE ADSORBENTS

Armand J. De Rosset, Clarendon Hills, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Oct. 13, 1969, Ser. No. 865,994
Int. Cl. C07c *7/12*
U.S. Cl. 260—674 SA **5 Claims**

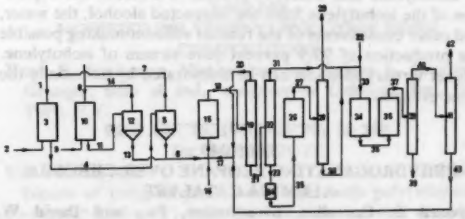
A process for the separation of an aromatic hydrocarbon from a mixture of aromatic isomers using a crystalline aluminosilicate adsorbent. A feed mixture comprising at least two aromatic-type hydrocarbons is passed through a bed of a faujasite structured adsorbent wherein one of the aromatics is preferentially adsorbed within the adsorbent. A subsequent desorption step is then used to desorb the selectively adsorbed feed component.

3,665,047

METHOD FOR THE SIMULTANEOUS PREPARATION OF A DIOLEFIN AND AN OLEFIN

Andre Gislon, Paris; Joseph-Edouard Welsang, Le Havre, and Jean Maurin, Montivilliers, all of France, assignors to Compagnie Francaise de Raffinage, Paris, France

Filed May 25, 1970, Ser. No. 40,278
Claims priority, application France, May 30, 1969, 17791
Int. Cl. C07c *1/00, 1/20*
U.S. Cl. 260—681 **11 Claims**



A method of preparing a diolefin and an olefin or an alkenyl benzene hydrocarbon simultaneously from more highly saturated hydrocarbons, said latter respectively having the same carbon structure as the desired end product pair, wherein the more highly saturated hydrocarbon precursors are reacted with oxygen to form respective hydroperoxides,

the latter are reacted with an ethylenic hydrocarbon having the same carbon structure as the diolefin precursor to form an epoxide or glycol which are in turn dehydrated to the desired diolefin; the first hydroperoxide forms an alcohol which is dehydrated to reform the ethylenic hydrocarbon for recycling; the second hydroperoxide forms an alcohol which is dehydrated to the desired olefin or alkenylbenzene (depending upon the form of the precursor); and the ketone byproducts formed during the reaction of said hydroperoxides with said ethylenic hydrocarbon (these being the other principle byproducts in this process) are reduced to an alcohol and then dehydrated to said ethylenic hydrocarbon for recycling.

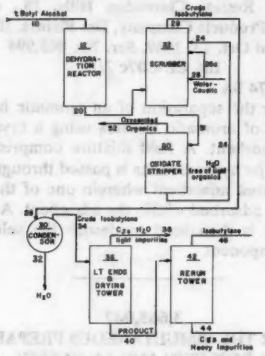
The foregoing process is particularly advantageous in the simultaneous production of isoprene and isobutylene from isopentane and isobutane or of isoprene and styrene from isopentane and ethyl benzene.

3,665,048

PROCESS TO PRODUCE HIGH PURITY ISOBUTYLENE

Henry R. Grane, and Isadore Edward Katz, both of Springfield, Pa., assignors to Atlantic Richfield Company, New York, N.Y.

Filed Jan. 14, 1970, Ser. No. 2,773
Int. Cl. C07c 1/20
U.S. Cl. 260—682 **10 Claims**



Essentially pure isobutylene is obtained by the controlled dehydration of a feed stream containing tertiary butyl alcohol and only traces of butenes. Dehydration takes place over an aluminum oxide catalyst wherein the reaction zone is maintained between 400° and 800° F. and preferably between 97.5 and 99.5 percent of the alcohol is converted primarily to isobutylene and water. A process is included for separation of the isobutylene from the unreacted alcohol, the water, and other constituents of the reactor effluent making possible the production of 99.9 percent pure stream of isobutylene. Higher tertiary alcohols can be dehydrated by essentially the same process.

3,665,049

DEHYDROGENATING PROPANE OVER CHROMIA-ALUMINA CATALYST

Edward B. Cornelius, Swarthmore, Pa., and David W. Koester, Wilmington, Del., assignors to Air Products and Chemicals, Inc., Philadelphia, Pa.

Filed May 28, 1970, Ser. No. 41,549
Int. Cl. C07c 5/18
U.S. Cl. 260—683.3 **4 Claims**

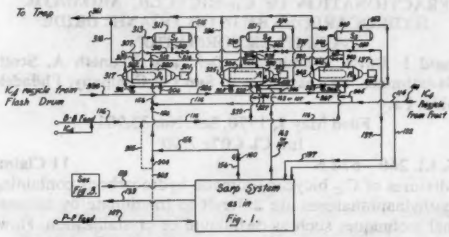
Triethyl aluminum is employed as reactant in a conversion to valuable products, forming an alumina by-product consisting predominantly of alumina alpha-monohydrate and a significant amount of amorphous alumina. Particles of this by-product are marketed as a technical grade of boehmite. A precursor mixture is prepared comprising calcined alumina powder, a larger amount of said technical grade of boehmite, and an aqueous solution containing ammonium dichromate. Said mixture is extruded, sliced into pellets, calcined in steam, and cooled to provide dehydrogenation catalyst consisting of about 20 percent chromia and 80 percent alumina. Propane at subatmospheric pressure is dehydrogenated at a high conversion per pass to provide an attractive yield of propene over said catalyst at 570°–680° C. at a space velocity of from about 0.2 to about 5 volumes of liquid propane per volume of catalyst per hour during a commercially acceptable catalyst life.

3,665,050

ALKYLATION OF DIALKYL SULFATE OBTAINED FROM AN OVERHEAD ABSORPTION PHASE

Louis J. McGovern, Prairie Village; Charles L. West, Shawnee Mission, and Orlando Webb, Prairie Village, all of Kans., assignors to Stratford Engineering Corporation, Kansas City, Mo.

Filed Apr. 21, 1969, Ser. No. 817,535
Int. Cl. C07c 3/54
U.S. Cl. 260—683.62 **2 Claims**



Combination process for the alkylation of isoparaffin with olefinic material in the presence of sulfuric acid alkylation catalyst wherein olefin hydrocarbon is reacted with used acid catalyst in an absorption zone producing a lighter overhead phase comprising unreacted hydrocarbon together with a portion of the dialkyl sulfate thus formed, and a heavier acid-alkyl sulfate phase comprising the remainder of the dialkyl sulfate. The dialkyl sulfate content of the heavier phase is extracted with isoparaffin being alkylated and the extract solution is passed to an alkylation reactor. The lighter phase from the absorption zone is reacted with isobutane in a different alkylation reactor, optionally in the presence of an additional quantity of the same type olefin reacted to form the dialkyl sulfate.

3,665,051

POLY(2,6-DIPHENYLPARAPHENYLENEOXIDE) FIBER-REINFORCED SILICONE MOLDING COMPOSITIONS

Jan Bussink, Arnhem, Netherlands, assignor to Akzo N.V., Arnhem, Netherlands

Filed June 23, 1970, Ser. No. 49,172
Claims priority, application Netherlands, July 11, 1969, 6,910,674
Int. Cl. C08g 42/02, 47/10
U.S. Cl. 260—824 **2 Claims**

A fiber-reinforced silicone molding composition that comprises an admixture of a silicone polymer having a dielectric constant lower than 3.5 and fibers of poly(2,6-diphenylparaphenyleneoxide).

3,665,052

METHOD OF PREPARING A BLOCK COPOLYMER CONTAINING A POLY-ALPHA-METHYLSTYRENE BLOCK AND A POLYDIORGANOSILOXANE BLOCK

John C. Saam, and Frederick W. G. Fearon, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Aug. 25, 1970, Ser. No. 66,891
Int. Cl. C08g *47/10*; C08f *33/08*
U.S. Cl. 260—827 1 Claim

Block copolymers containing a poly-alpha-methylstyrene block and a polydiorganosiloxane block are prepared by polymerizing alpha-methylstyrene with a lithium initiator at about −70° C., a small amount of styrene is then added and polymerized onto the poly-alpha-methylstyrene before the temperature is raised to ambient temperature to polymerize polydiorganocyclosiloxanes and forming a block copolymer having the stated blocks. The block copolymers can vary from thermoplastic materials to elastomers.

3,665,053

PROCESS FOR PREPARING POLYMERS FROM ETHYLENICALLY UNSATURATED GLYCIDYL MONOMERS

Yukio Mizutani, and Seishiro Matsuoka, both of Tokuyama-shi, Japan, assignors to Tokuyama Soda Kaubushiki Kaisha, Tokuyama-shi, Japan

Filed Nov. 25, 1969, Ser. No. 879,697
Claims priority, application Japan, Nov. 25, 1968, 43/85602
Int. Cl. C08g *45/04*, *39/10*; C08f *37/18*
U.S. Cl. 260—836 6 Claims

In the process for the preparation of finely divided high polymers of a cross-linked structure comprising polymerizing a monoethylenically unsaturated monomer and a diethylenically unsaturated monomer, in an organic solvent, an improvement characterized in that prior to the polymerization a linear polymer selected from the group consisting of hot n-heptane-soluble monoolefin polymers, polyalkylene oxides and vinyl chloride polymers is dissolved in said organic solvent.

3,665,054

DYEABLE POLYAMIDES CONTAINING POLYSTYRENE SULFONIC ACID

Harold George Burrows, and Philip Bierley Ingham, both of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

Filed May 10, 1968, Ser. No. 728,319
Claims priority, application Great Britain, May 16, 1967, 22,723/67
Int. Cl. C08g *41/04*
U.S. Cl. 260—857 UN 3 Claims

Synthetic linear polyamides which contain a small amount of an alkali metal salt of a polystyrene polysulphonic acid, and dyeing fibers of the said polyamides with Basic Dyestuffs.

3,665,055

POLYMERIZABLE UNSATURATED POLYESTER RESIN COMPOSITIONS AND ARTICLES MADE THEREFROM

John A. Hatton, Jr., 8030 Chaske St., Verona, Pa., and John S. McNally, 457 Glenview Dr., Lower Burrell, Pa.

Filed Oct. 22, 1969, Ser. No. 868,603
Int. Cl. C08f *43/02*, *43/06*
U.S. Cl. 260—862 16 Claims

Styrene-maleic anhydride copolymer is added to a polymerizable composition containing an unsaturated polyester resin and a vinyl monomeric material which is capable of reacting with the polyester resin to form a thermoset polymer. The composition can be molded into articles as it is polymerized. The articles have improved properties, including improved surface properties, due to the use of the styrene-maleic anhydride copolymer. Glass fibers, as well as other materials generally included in polymerizable polyester compositions can be used also. The composition can be used to prepare chemically thickened resin mats or prepregs which can be molded and cured into articles having improved properties, including improved surface and dimensional stability properties.

3,665,056

CYCLOHEXYLENE POLYESTER DYE RECEPTORS

James W. Cleary, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed Aug. 3, 1970, Ser. No. 60,611
Int. Cl. C08g *39/10*; D06p *3/00*
U.S. Cl. 260—873 9 Claims

A process for dyeing polyolefins in which there is incorporated in the polyolefin a polyester formed as the reaction product of 1,4-cyclohexanediol and a paraffinic dicarboxylic acid.

3,665,057

METHOD OF PREPARING HIGH IMPACT RESISTANCE RESINS BY A BULK-SUSPENSION TWO STAGE PROCESS

Atsushi Tanaka, Tokyo; Hiroomi Kobayashi, Saitama; Teizo Kudo, Saitama, and Masatoshi Mikumo, Saitama, all of Japan, assignors to Daicel Ltd., Osaka, Japan

Filed Feb. 5, 1970, Ser. No. 9,067
Claims priority, application Japan, Feb. 8, 1969, 44/9580
Int. Cl. C08f *41/12*
U.S. Cl. 260—876 R 9 Claims

A thermoplastic resin having a high impact resistance is made by subjecting a mixture or a solution of a first quantity of an elastomeric polymer in a monovinyl aromatic hydrocarbon monomer or a mixture of a monovinyl aromatic hydrocarbon monomer and a copolymerizable monovinyl monomer to a bulk-suspension two stage polymerization process. A second quantity of an elastomer consisting of an aqueous latex of butadiene rubber is added to the mixture or solution during the preliminary bulk polymerization step when the conversion of the monomer or monomer mixture to the polymer is about from 10 to 50 percent by weight.

3,665,058

MODIFIED POLYPHENYLENE OXIDE RESIN COMPOSITIONS

Hugh E. Snodgrass, Mishawaka, and Robert L. Lauchlan, Granger, both of Ind., assignors to Uniroyal, Inc., New York, N.Y.

Filed Apr. 20, 1970, Ser. No. 30,280
Int. Cl. C08f *29/12*
U.S. Cl. 260—889 52 Claims

Blends of polyphenylene oxide resin with poly(ethylene-co-organic-acid-ester) resins provide thermoplastic compositions characterized by unique properties, particularly an unusually useful combination of high impact strength, high thermal stability, high tensile strength, and high elastic moduli. Such compositions are optionally modified through the inclusion of an alkenyl aromatic resin (e.g., polystyrene, etc.), to exhibit much improved melt processing characteristics in addition to high strength properties.

3,665,059

POLYPHASE PROPYLENE POLYMER-RUBBER COMPOSITIONS AND PROCESS FOR THEIR PREPARATION

Bert H. Mahlman, West Chester, Pa., assignor to Hercules Incorporated, Wilmington, Del.

Continuation-in-part of application Ser. No. 670,412, Sept. 25, 1967, now abandoned. This application June 26, 1970, Ser. No. 50,301

Int. Cl. C08f *29/12*

U.S. Cl. 260—897 A 7 Claims

Polyphase compositions having, as a continuous phase a propylene polymer and as a second phase a synthetic or natural rubber, are prepared by dispersing a propylene polymer of substantially all sub-micron particle size in the second phase and fusing the polymer under controlled conditions which assure the formation of the propylene polymer into a continuous phase.

3,665,060

RESIN BLEND CONTAINING ETHYLENE/VINYL CHLORIDE INTERPOLYMER

Joseph G. Bergomi, Jr.; Dale R. Dill, both of St. Louis, and Paul R. Graham, Ballwin, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Nov. 17, 1969, Ser. No. 877,486

Int. Cl. C08f *37/18*

U.S. Cl. 260—897 C 9 Claims

Modified ethylene/vinyl chloride interpolymers useful as pigment binders of adhesives in pigment coating compositions for paper, paperboard and similar materials, said modified interpolymer being used alone or in combination with paper coating starch of protein material. The modified ethylene/vinyl chloride interpolymer comprises (1) an interpolymer of ethylene, vinyl chloride and optionally one other polar monomer and (2) a salt of an interpolymer of an alpha, beta-unsaturated polycarboxylic acid and a member selected from the group consisting of alpha olefins, alkyl vinyl ethers and vinyl alkanoates.

3,665,061

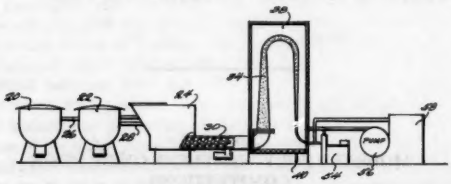
PROCESS FOR PRODUCING COLLAGEN SPONGES

David H. Eberly, Jr., Fairfield, Conn., assignor to United States Banknote Corporation, New York, N.Y.

Filed July 16, 1969, Ser. No. 842,251

Int. Cl. A24c *5/48*; B29d *27/06*; C08h *7/06*

U.S. Cl. 264—49 9 Claims



A method for producing a spongy mass of compacted collagen particles having a large surface area to volume ratio and suitable for use in filtering materials such as tobacco smoke. To form the spongy mass, finely granulated collagen particles are mixed with snow, frozen carbon dioxide or similar material, and the mixture chopped and mixed at temperatures below the freezing point to cause entwining of the distal fibers and impart binding. The mixture is then compacted and forced through a forming tube having a gradually decreasing diameter and porous walls through which the supporting snow or carbon dioxide matrix is removed. A compacted tube or rod of collagen sponge suitable for filtering cigarette or tobacco smoke merges from the forming tube and can be cut or otherwise treated as desired.

3,665,062

PREPARATION OF CONJUGATED DIENE POLYMERS USING ATE-COMPOUND CATALYSTS

Akira Onishi; Ryota Fujio, and Minoru Kojima, all of Tokyo, Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Sept. 8, 1969, Ser. No. 856,170

Claims priority, application Japan, Sept. 16, 1968, 43/66127

Int. Cl. C08f *1/74*

U.S. Cl. 260—84.1 8 Claims

Conjugated diene polymers having a microstructure consisting of about 70% of trans-1,4-structure, about 20 percent of cis-1,4-structure and about 10 percent of 1,2- or 3,4-structure is prepared by polymerizing (1) at least one conjugated diene or (2) a mixture of a conjugated diene and a vinyl-substituted aromatic hydrocarbon by using an "Ate-compound" catalyst having the following general formula

$$M^1M^2R^1R^2R^3R^4$$

wherein M^1 is calcium, strontium or barium, M^2 is zinc or cadmium, and R^1, R^2, R^3 and R^4 are aliphatic, cycloaliphatic or aromatic hydrocarbon radicals containing from one–ten carbon atoms.

3,665,063

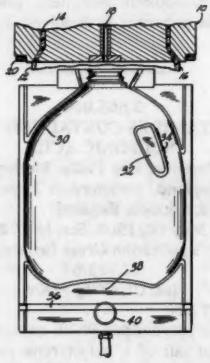
METHOD FOR BLOW MOLDING HOLLOW ARTICLES IN MINIMUM CYCLE TIME

Samuel J. Rupert, and William E. Ziegler, both of Ann Arbor, Mich., assignors to Hoover Ball and Bearing Company, Saline, Mich.

Continuation of application Ser. No. 722,978, Apr. 22, 1968, now abandoned. This application Apr. 15, 1970, Ser. No. 28,211

Int. Cl. B29c *17/07*

U.S. Cl. 264—89 3 Claims



A method of making a hollow plastic article characterized by a low cycle time. A mold is cooled to a selected temperature below ambient, a tube of plastic material open at its leading end is extruded to a length greater than the length of the article to be formed, and the tubing is enclosed in the mold at a mold closing rate such that condensation has not formed in the mold. During the closing of the mold, the leading end of the tubing is closed and sealed to entrap air at atmospheric pressure and a sufficient portion of the leading end of the sealed tube is collapsed by the closing mold to reduce the internal volume of the tubing and partially expand the tubing due to the resulting increase of internal pressure. Air is then injected into the partially expanded tubing to inflate the tubing to final form in the closed mold and the mold is then opened and the finished article rejected in the minimum cycle time comensurate with the selected temperature to which the mold is cooled.

3,665,064

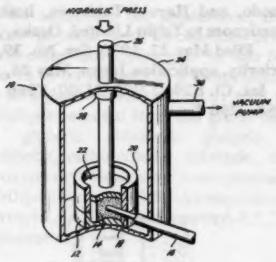
METHOD OF MAKING A PERSPIRATION RESISTANT BIOPOTENTIAL ELECTRODE

Benjamin Mosier, and Joe L. Day, both of Houston, Tex., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Original application Jan. 5, 1967, Ser. No. 607,461, now Patent No. 3,490,440. Divided and this application May 9, 1969, Ser. No. 844,225

Int. Cl. A61b *5/04*

U.S. Cl. 264—104 2 Claims



To a conventional biopotential electrode mixture is added 5–15 percent of a colloidal material which acts as a screen for undesirable ions resulting from perspiration. This colloidal ion screening material is selected from a group consisting of various gums, bentonite clay, and a magnesium aluminum silicate clay-like material. The mixture is pressed into shape around an electrode wire after being subjected to a partial vacuum.

3,665,065

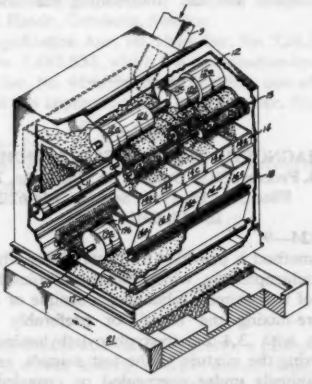
METHOD FOR MOLDING ARTICLES OF UNEVEN THICKNESS

Herbert G. Hass, In den Klaeren 27; Edmund Munk, In den Klaeren 25, both of 7141 Oberstenfeld; Alfred Fink, Gerh.-Hauptmann-Str. 9, 7336 Uhingen, and Erich Klink, Mozartstrase 11, 7331 Kaurndau, all of Germany

Original application June 30, 1969, Ser. No. 837,649, which is a continuation-in-part of application Ser. No. 698,050, Jan. 15, 1968, now abandoned , Continuation of application Ser. No. 437,107, Mar. 4, 1965, now abandoned. Divided and this application Dec. 15, 1969, Ser. No. 889,801

Int. Cl. B29j *5/00*

U.S. Cl. 264—113 5 Claims



A method of preforming moldable compositions of fibrous materials and a binder in which the preform has portions along its width having different thicknesses corresponding to different thicknesses of the final molded product. Initially the composition is formed into a mat which has a thickness at least equal to the thickest portion of the preform, and then excess material is removed from across the width of the mat by scalping rolls to develop the contoured preform having different thicknesses. Each section of the mat having a different thickness is weighed separately to insure proper density of that section of the mat. Following the weighing step, the mat is again shaped into the contoured preform and placed into a mold for a subsequent heating and pressing operation.

3,665,066

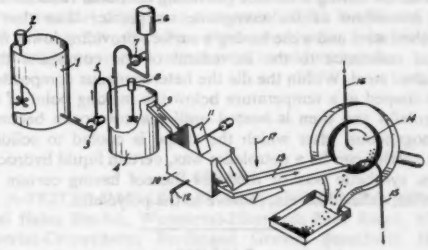
BENEFICIATION OF COALS

Charles E. Capes; Allan E. McIlhinney, both of Ottawa, and Richard D. Coleman, Orleans, Ontario, all of Canada, assignors to Canadian Patents and Development Limited, Ottawa, Ontario, Canada

Filed Nov. 28, 1972, Ser. No. 880,741

Int. Cl. B01j *2/14*

U.S. Cl. 264—117 10 Claims



A process for producing a balled coal product from coal fines involves mixing a bridging liquid with coal fines and agitating the formed mixture in an aqueous medium to cause agglomeration of the coal particles. The coal particle agglomerates are then at least partially de-watered and fed to a balling device, together with a balling nuclei of coarse coal particles and binding oil to form a balled product in which each ball comprises at least one balling nucleus in association with coal particles derived from the agglomerates. The balled coal product is moved from the balling device when formed.

3,665,067

POLYTETRAFLUOROETHYLENE FABRICATION WITH HEXAFLUOROBENZENE

William Hopkin, Avonmouth, Bristol, England, assignor to Imperial Smelting Corporation (N.S.C.) Limited, London, England

Continuation of Ser. No. 610,192, Jan. 18, 1967, abandoned.

Filed July 24, 1970, Ser. No. 64,062

Int. Cl. B29f *3/00*; C08f *45/30*

U.S. Cl. 264—127 7 Claims

Polytetrafluoroethylene (ptfe) is fabricated into shaped products with the use of hexafluorobenzene as a plasticizer. The ptfe may be particulate, and may be fabricated by ram extrusion. From 8 to 16 percent by volume of the hexafluorobenzene is mixed with the ptfe and maintained in contact with it for long enough to be absorbed onto and just into the surface of the ptfe.

3,665,068

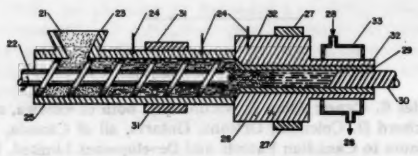
EXTRUSION OF EXTREMELY HIGH MOLECULAR WEIGHT POLYOLEFINS

Irl N. Duling, West Chester, and John C. Merges, Jr., Glen Mills, both of Pa., assignors to Sun Oil Company, Philadelphia, Pa.

Continuation-in-part of application Ser. No. 745,884, July 18, 1968, now abandoned. This application Dec. 15, 1969, Ser. No. 884,879

Int. Cl. B29b *1/04;* B29f *1/08;* C08f *45/52*

U.S. Cl. 264—211 8 Claims



A polyethylene having a molecular weight in excess of 1,000,000 or a polypropylene having a molecular weight in excess of 400,000 can be easily extruded by this invention. A heterogeneous composite of either polyolefin and a carrier is established and supplied to an extruder comprising a transport screw having a surface providing frictional resistance to the movement of the composite no greater than that of polished steel and a die having a surface providing lower frictional resistance to the movement of the composite than polished steel. Within the die the heterogeneous composite is first shaped at a temperature below the melting point of the polyolefin and then is heated until the composite becomes homogeneous, after which the shape is cooled to solidify. The carrier can be a petroleum wax, certain liquid hydrocarbons, synthetic wax or mixtures thereof having certain attributes, defined herein, relative to the polyolefin.

3,665,069

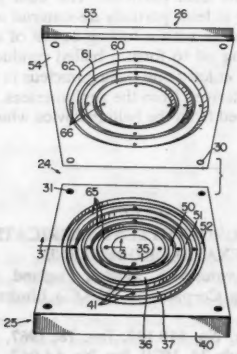
METHOD OF MAKING POWER TRANSMISSION BELTS

Kenneth D. Richmond, Nixa, Mo., assignor to Dayco Corporation, Dayton, Ohio

Filed Feb. 13, 1970, Ser. No. 11,158

Int. Cl. B29c *1/16*

U.S. Cl. 264—219 9 Claims



A plurality of individual power transmission belts are made in a simultaneous manner utilizing the method of this invention while making full use of standard injection molding equipment. The method employs an apparatus comprised of a lower structure and an upper structure suitably fastened together and having cooperating surface means which define a plurality of annular cavities with each cavity defining an associated belt. The cavities are supplied from a common sprue and the plurality of belts are formed by the simultaneous injection of elastomeric material into such cavities and then curing and cooling the material to define the transmission belts.

3,665,070

METHOD OF AIR-CONDITIONING UNDRAWN YARN PACKAGE IN DRAWING MACHINE

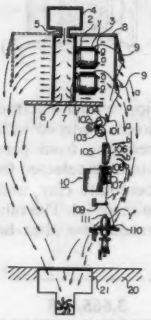
Takao Knodo, and Haruki Takizawa, both of Matsuyama, Japan, assignors to Teijin Limited, Osaka, Japan

Filed May 22, 1970, Ser. No. 39,612

Claims priority, application Japan, May 26, 1969, 44/40768

Int. Cl. B29c *17/02, 25/00;* F26b *13/10*

U.S. Cl. 264—290 T 7 Claims



In a yarn drawing process of unwinding undrawn yarn from undrawn yarn packages placed on a creel stand located above a drawing machine, comprising introducing the undrawn yarn unwound to a hot drawing zone below for the hot drawing of the yarn and winding up the drawn yarn, the improvement comprising blowing the air conditioned to a predetermined temperature and humidity against the undrawn yarn packages from behind or above the packages and thereby preventing the hot air generated in the hot drawing zone from approaching the undrawn yarn packages placed on the creel stand and air conditioning the undrawn yarn packages.

3,665,071

DIAGNOSTIC TEST FOR SCHIZOPHRENIA

Charles D. Proctor, 3834 Dunbar Dr., Nashville, Tenn.

Filed July 15, 1968, Ser. No. 744,628

Int. Cl. G01n *33/16*

U.S. Cl. 424—9 5 Claims

A test method is provided for determining whether a person is a schizophrenic, which comprises suitably treating a plurality of test animals, obtaining a sample of the person's blood, pre-mixing the blood, or preferably the plasma therefrom with 3,4-dimethoxyphenylethylamine, internally administering the mixture to the test animals, and maintaining the animals under aggregated or crowded conditions while observing their behavior for amphetamine-like reaction and lethality as an indication of the presence of schizophrenia in the blood sample donor.

3,665,072

METHOD OF IMPROVING THE COSMETIC PROPERTIES OF HAIR BY USING ALDEHYDE SOLUTION

Gregorire Kalopissis, Paris, and Jean-Louis Abegg, Perreux, both of France, assignors to L'Oreal, Paris, France

Continuation of application Ser. No. 565,393, July 15, 1966, now abandoned. This application May 13, 1970, Ser. No. 37,431

Claims priority, application Luxembourg, July 29, 1965, 49208

Int. Cl. A61k 7/06

U.S. Cl. 424—70 3 Claims

1. A process for improving the appearance, the feel, the combing and the physical and mechanical properties of human hair which comprises applying to the hair for a period of time between 15 to 60 minutes at a temperature between 15° and 60° C. an aqueous solution of 0.01 to 8 percent by weight of an aldehyde selected from the group consisting of glycolaldehyde, glyceric aldehyde, glutaric aldehyde, terephthalic aldehyde, orthophthalic aldehyde, starch dialdehyde, 2-hydroxymethyl-4-methoxy-3-oxa-pentanedial 4,6-diformyl-2,4,8-trihydroxymethyl-3,5,7-trioxanonanedial and 4,6,8,11-tetraformyl-2,4,13-trihydroxymethyl-3,5,7,10,12-penta oxa tetradecane dial.

3,665,073

PHARMACEUTICALS PREPARED FROM POLYCYCLIC BASES AND CATION EXCHANGE RESINS

Alan Marshall, Bollington, and Anne Wilson Macpherson, Macclesfield, both of England, assignors to Geigy Chemical Corporation, Ardsley

Filed Aug. 8, 1968, Ser. No. 751,047

Claims priority, application Great Britain, Aug. 12, 1967, 37,136/67

Int. Cl. A61k 27/00

U.S. Cl. 424—79 3 Claims

Pharmaceutical compositions suitable for oral administration are prepared from non-ionisable polycyclic bases, an ion-exchange resin containing carboxylic acid groups and a pharmaceutically acceptable carrier liquid. These compositions are used for producing an anti-depressant effect in mammals. A typical embodiment is a composition containing imipramine and Zeo-Karb 226.

3,665,074

CERTAIN BENZOFURAN DERIVATIVES USEFUL FOR RELIEF OF PAIN, INFLAMMATION, PYRESIS AND TUSSIVE IRRITATION

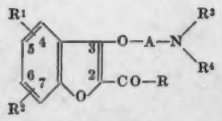
Arne Elof Brandstrom, Goteborg, and Stig Ake Ingemar Carlsson, Molnlycke, both of Sweden, assignors to Aktiebolaget Hassle, Goteborg, Sweden

Original application Apr. 10, 1968, Ser. No. 720,399, now Patent No. 3,485,835, which is a continuation-in-part of application Ser. No. 414,894, Nov. 30, 1964, now abandoned. Divided and this application May 20, 1969, Ser. No. 839,127

Int. Cl. A61k 27/00

U.S. Cl. 424—248 12 Claims

The specification discloses benzofuran derivatives characterized by the formula:



I

wherein R represents a lower alkyl group, a phenyl group or a lower alkyl, lower alkoxy, dioxy-lower-alkylene, fluorine, chlorine, bromine or trifluoromethyl substituted phenyl group or a lower alkoxy substituted styryl group, R^1 represents a hydrogen, fluorine, chlorine or bromine atom or a lower alkyl or lower alkoxy group, or together with R^2 represents a benzo group, R^2 represents a hydrogen, fluorine, chlorine or bromine atom or a lower alkyl or lower alkoxy group or provided R^1 is a hydrogen atom, a nitro, amino, hydroxy, lower acyloxy, lower alkoxybenzoyloxy, lower dialkylamino or lower acylamino group, A represents an alkylene group containing not more than four carbon atoms, R^3 represents a hydrogen atom or a lower alkyl group, R^4 represents a lower alkyl, β-phenylethyl or benzyl group or NR^3R^4 represents a pyrrolidino, piperidino, hexamethyleneimino, morpholino, lower dialkylmorpholino, piperazino, lower alkyl piperazino, benzylpiperazino or tetrahydropyridino group, in the form of the free base or of a pharmaceutically acceptable salt thereof.

3,665,075

THOZALINONE AS AN ANTI-PARKINSON AGENT

William David Gray, New City, N.Y., and Charles Edward Rauh, Emerson, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Aug. 7, 1970, Ser. No. 62,181

Int. Cl. A61k 27/00

U.S. Cl. 424—272 3 Claims

This disclosure describes a method of controlling the tremor and rigidity of Parkinson's disease or a drug-induced extrapyramidal disorder in a mammal which is afflicted with said disease or disorder which comprises administering thozalinone or anionic salts thereof to said mammal.

3,665,076

N-TRITYL-IMIDAZOLES AS PLANT FUNGICIDES

Karl Heinz Buchel, Wuppertal-Elberfeld; Erik Regel, Wuppertal-Cronenberg; Ferdinand Grewe, Burscheid; Hans Scheinpflug, and Helmut Kaspers, both of Leverkusen, all of Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

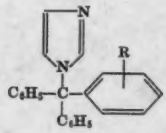
Original application Jan. 7, 1969, Ser. No. 789,601. Divided and this application Sept. 2, 1970, Ser. No. 69,107

Claims priority, application Germany, Jan. 29, 1968, P 16 70 976.5

Int. Cl. A01n 9/22

U.S. Cl. 424—273 7 Claims

Plant fungicidal compositions are produced which comprise an amount of a compound of the formula:



wherein R is alkoxy of one to three carbon atoms, sufficient to be effective for killing, combatting or controlling plant fungi, in combination with a solid or liquid diluent or carrier. Methods for killing, combatting or controlling fungal diseases in plants comprise applying to the fungi or to the plant to be protected an effective or toxic amount of the above compound.

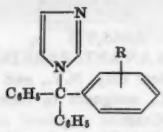
3,665,077

N-TRITYL-IMIDAZOLES AS PLANT FUNGICIDES

Karl-Heinz Buchel, Wuppertal-Elberfeld; Erik Regel, Wuppertal-Cronenberg; Ferdinand Grewe, Burscheid; Hans Scheinpflug, and Helmut Kaspers, both of Leverkusen, all of Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 789,601, Jan. 7, 1969.
Filed Sept. 2, 1970, Ser. No. 69,108
Claims priority, application Germany, Jan. 29, 1968, P 16 70 976.5
Int. Cl. A01n 9/22
U.S. Cl. 424—273 **6 Claims**

Plant fungicidal compositions are produced which comprise an amount of a compound of the formula:



wherein R is alkylmercapto of one to three carbon atoms, sufficient to be effective for killing, combatting or controlling plant fungi, in combination with a solid or liquid diluent or carrier. Methods for killing, combatting or controlling fungal diseases in plants comprises applying to the fungi or to the plant to be protected an effective or toxic amount of the above compound.

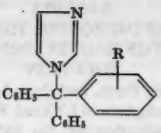
3,665,078

N-TRITYL-IMIDAZOLES AS PLANT FUNGICIDES

Karl-Heinz Buchel, Wuppertal-Elberfeld; Erik Regel, Wuppertal-Cronenberg; Ferdinand Grewe, Burscheid; Hans Scheinpflug, and Helmut Kaspers, both of Leverkusen, all of Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Original application Jan. 7, 1969, Ser. No. 789,601. Divided and this application Sept. 2, 1970, Ser. No. 69,111
Claims priority, application Germany, Jan. 29, 1968, P 16 70 976.5
Int. Cl. A01n 9/22
U.S. Cl. 424—273 **5 Claims**

Plant fungicidal compositions are produced which comprise an amount of a compound of the formula:



wherein R is nitro, sufficient to be effective for killing, combatting or controlling plant fungi, in combination with a solid or liquid diluent or carrier. Methods for killing, combatting or controlling fungal diseases in plants comprise applying to the fungi or to the plant to be protected an effective or toxic amount of the above compound.

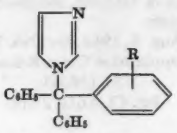
3,665,079

N-TRITYL-IMIDAZOLES AS PLANT FUNGICIDES

Karl-Heinz Buchel, Wuppertal-Elberfeld; Erik Regel, Wuppertal-Cronenberg; Ferdinand Grewe, Burscheid; Hans Scheinpflug, and Helmut Kaspers, both of Leverkusen; all of Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Original application Jan. 7, 1969, Ser. No. 789,601. Divided and this application Sept. 2, 1970, Ser. No. 69,112
Int. Cl. A01n 9/22
U.S. Cl. 424—273 **7 Claims**

Plant fungicidal compositions are produced which comprises an amount of a compound of the formula:



wherein R is alkyl of one or two carbon atoms substituted by one to five fluoro moieties, sufficient to be effective for killing, combating or controlling plant fungi, in combination with a solid or liquid diluent or carrier. Methods for killing, combatting or controlling fungal diseases in plants comprise applying to the fungi or to the plant to be protected an effective or toxic amount of the above compound.

3,665,080

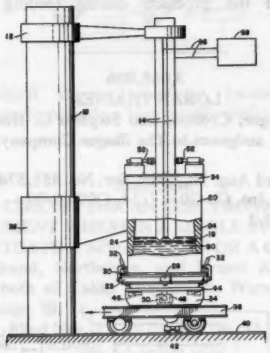
REMELTING SYSTEM AND PROCESS UTILIZING VARYING VOLTAGE, CURRENT AND MELTING RATE

Boris Izrailevich Medovar, Boulevar Lesy Ukrainky 2, Apt. 8, Kiev 23; Jury Vadimorich Latash, Ul. Artema 55, Apt. 23, Kiev 59; Oleg Petrovich Bondarenko, Ul. Khreshchatic 15, Apt. 34, Kiev 1, and Alexsey Georgievich Bogachenko, Ul. Meljutenko 15/2, Apt. 141, Kiev 140, all of U.S.S.R.

Filed May 28, 1970, Ser. No. 41,168

Int. Cl. H05b *7/18*

U.S. Cl. 13—9 32 Claims



A bifilar electroslag remelting system is provided with a means to vary the voltage applied to the electrodes. As a result the voltage, current, and melting rate can be varied as a function of time to optimize refining efficiency, to minimize formation of cracks and strata in the finished product refined ingot, and to provide the additional advantage of eliminating the necessity of varying the water rate in the cooling element of the remelting system.

3,665,081

APPARATUS FOR ELECTROSLAG REMELTING OF CONSUMABLE ELECTRODES

Boris Evgenievich Paton, ulitsa Kotsjubinskogo 9, kv. 21; Vladimir Konstantinovich Lebedev, ulitsa Engelsa, 25, kv. 12; Boris Izrailevich Medovar, Bulvar Lesi Ukrainki, 2, kv. 8; Igor Vladimirovich Pentegov, Zadorozhny pereulok, 3, kv. 14; Jury Vadimovich Latash, Vozdukhoflotsky prospekt, 81, kv. 14; Oleg Petrovich Bondarenko, ulitsa Kreschatik, 15, kv. 34; Vitaly Mikhailovich Baglai, ulitsa Semashko, 10, kv. 54/3; Nikolai Vasilievich Podola, ulitsa Pushkinskaya, 8, kv. 12, and July Georgievich Emelyanenko, ulitsa Darvina, 5, kv. 5, all of Kiev, U.S.S.R.

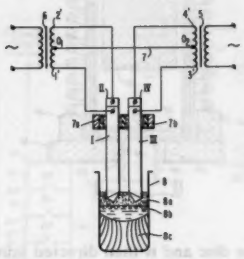
Filed Apr. 8, 1970, Ser. No. 26,733

Claims priority, application U.S.S.R., June 16, 1969, 1,336,305

Int. Cl. H05b *3/60*

U.S. Cl. 13—12 23 Claims

The invention relates to the field of electrometallurgy, and in particular to an apparatus for electroslag remelting. The apparatus is characterized in that it has a transformer power supply means, which can be three-phase or which can consist of several single-phase transformers, the secondary windings of which are provided with center tappings which are interconnected through busbar conductors so as to provide for an equality of the line speeds of melting the electrodes and for a uniform temperature field within the slag bath. The invention can be utilized in the process of producing unique hollow or



solid ingots and slabs of high-grade steels and alloys having a weight of 200 tons and higher.

3,665,082

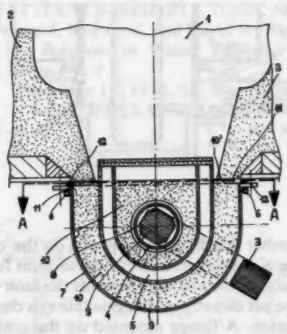
INDUCTOR APPLICABLE TO ELECTRIC FURNACES FOR METAL CASTING

Giovanni Bolla, Viali G. da Cermenate 61, Milano, Italy

Filed June 17, 1970, Ser. No. 47,035

Int. Cl. H05b *5/00*

U.S. Cl. 13—26 3 Claims



An inductor associated with an electric furnace for metal casting, and provided, where juxtaposed to the tank of the furnace, with a perimetric cavity sealed by refractory material in tamped condition, acting as a safety packing and filling all the inner room of the inductor body and building an embossed step in the jointing zone between inductor and tank.

3,665,083

APPARATUS FOR MELTING TITANIUM

Clyde C. Clark, Eucild, Ohio, assignor to TRW Inc., Cleveland, Ohio

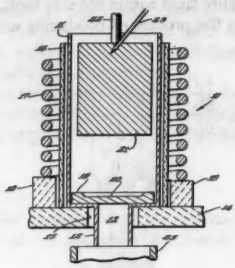
Original application Oct. 14, 1968, Ser. No. 767,168, now Patent No. 3,598,168. Divided and this application Mar. 10, 1971, Ser. No. 122,853

Int. Cl. F27d *3/15;* H05b *5/00*

U.S. Cl. 13—26 6 Claims

Apparatus for melting and casting a titanium alloy including an inductively heated furnace surrounding a refractory crucible, the titanium alloy to be melted being suspended as a slug in spaced relation to the walls of the crucible. A titanium alloy disc is positioned in the crucible at the discharge

outlet thereof so that when the temperature of the slug is brought to the melting point, the resulting molten metal



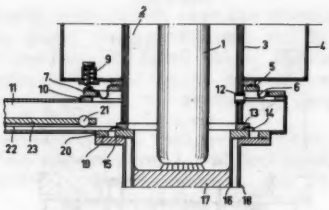
melts through the disc and is then directed immediately to a mold.

3,665,084

CONSUMABLE ELECTRODE VACUUM FURNACE

Klaus P. Samietz, Monroeville, Pa.; Anton Wamser, Hanau Main, and Ernst F. Weingartner, Hailer, both of Germany, assignors to Leybold-Heraeus GmbH & Co., Cologne-Bayental, Germany

Filed Sept. 29, 1969, Ser. No. 861,674
Int. Cl. F27d 7/06
U.S. Cl. 13—31 **5 Claims**



A lock chamber fixedly superimposed on the open top of the crucible in a consumable-electrode vacuum furnace, and an opening through the chamber permits the tank holding the electrode to be set directly on the crucible rim during normal furnace operation. A flange mounted on the tank by means of a pliable annular diaphragm seals the tank to the lock chamber while the tank moves. A valve plate in the chamber can be moved over the crucible top to seal the crucible while the tank with the electrode in the same is lifted, the tank is thereafter lowered upon the valve plate to hold in sealing engagement with the crucible top, and air can enter the lock chamber thereafter through the tank without impairing the vacuum in the crucible.

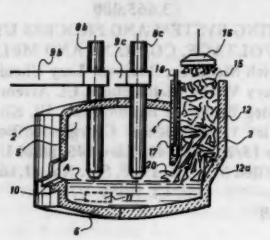
3,665,085

ELECTRIC ARC FURNACE FOR CONTINUOUSLY MELTING SCRAP IRON

Jacques Dumont-Fillon, and Charles Roederer, both of Metz (Moselle), France, assignors to Institut De Recherches De La Siderurgie Francaise, St. Germain en Laye, France

Filed July 25, 1969, Ser. No. 844,787
Claims priority, application France, July 31, 1968, 161243
Int. Cl. H05b 7/18; C21c 5/52
U.S. Cl. 13—9 **10 Claims**

A method for continuously melting metallic products, especially scrap iron, in an electric arc furnace and a furnace for carrying out the method, in which the products to be molten are fed into the furnace hearth through a compartment which communicates at its lower end with a lower portion of the hearth and which is separated by a refractory wall from the upper hearth portion so that the products while being fed



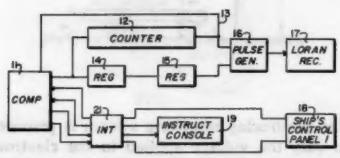
are protected from the heat produced by the electric arcs and fusion of the products during feeding thereof is prevented.

3,665,086

LORAN TRAINER

Edward F. Magee, Crofton, and Stephen G. Haube, Laurel, both of Md., assignors to The Singer Company, New York, N.Y.

Filed Aug. 20, 1969, Ser. No. 851,574
Int. Cl. G01s 1/24; G09b 9/00
U.S. Cl. 35—10.2 **8 Claims**



A trainer for teaching the principles of Loran and the operation of Loran receivers, which trainer comprises a general-purpose digital computer driving an interface which generates the appropriate Loran signals to simultaneously represent several pairs of Loran transmitters, and Loran receivers which are stimulated by the output from the interface. In addition, a "ship control" is provided by which the trainee can control the speed and direction of the simulated ship and watch the resultant changes affect the Loran reception, and an instructor's console containing equipment which allows an instructor to set up the initial conditions of a problem. The computer is programed to perform navigation computations based upon information applied to it from the instructor's console and the ship control to modify the effects of the simulated ship movement upon the Loran signals which are generated. Several receivers may be stimulated in parallel with the primary receiver.

3,665,087

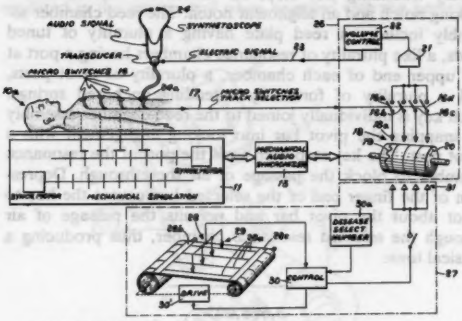
MANIKIN AUDIO SYSTEM

Michael C. Poylo, New York, N.Y., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Nov. 25, 1970, Ser. No. 92,788
Int. Cl. G09b 23/30
U.S. Cl. 35—17 **11 Claims**

The manikin audio system described is an audio simulation system in which it is not necessary to have the audio signals emanating directly from a physical area under auscultation, but in which the proper sound is acoustically coupled to the ears of a listener when a particular region of the manikin is explored. The audio simulation system comprises a synthetoscope having a transducer and a contact portion which activates one of a plurality of responsive means within

the manikin. Each of the responsive means selects an associated one of a plurality of stored signals and couples the



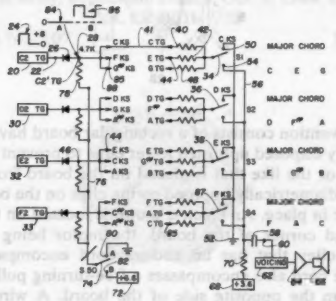
selected signal to a transducer located within the synthetoscope to provide a high quality audio signal.

3,665,088

KEYER CIRCUIT FOR AN ELECTRONIC MUSICAL INSTRUMENT WHEREIN A SINGLE SWITCH MAY ACTUATE A SINGLE NOTE OR A CHORD

John R. Brand, Northridge, and Ernest A. Smith, Santa Monica, both of Calif., assignors to Warwick Electronics Inc., Chicago, Ill.

Filed Nov. 27, 1970, Ser. No. 93,328
Int. Cl. G10h *1/00*
U.S. Cl. 84—1.01 **5 Claims**



A chord circuit is provided in which, upon positioning of a tab switch, the actuation of a given key will cause the sounding of a predetermined chord. Such chord circuits may be provided for a number of different chords, so that depending upon the tab switch which is operated, the actuation of the C key, for example, may cause the sounding, selectively, of C major chord, C minor chord, C diminished chord, and so forth. In the present circuit this is done without requiring the ganging of switch poles, so that the same single-pole key switch which is conventionally used to sound a given tone, also sounds the various preselected chords.

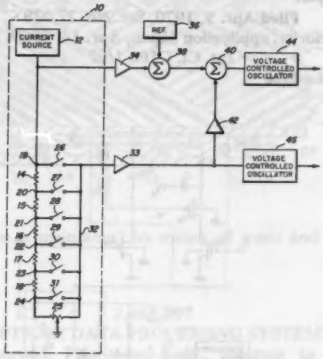
3,665,089

MUSIC SYNTHESIZER KEYBOARD

Richard E. Stearns, Sharon, Mass., assignor to Tonus, Inc., Newton, Mass.

Filed Dec. 17, 1970, Ser. No. 99,193
Int. Cl. G10h *1/00*
U.S. Cl. 84—1.01 **6 Claims**

The invention concerns a musical keyboard for providing a two-voiced output from a music synthesizer. The system includes a voltage divider which provides a plurality of values of potential and a plurality of switches each connected to a divider tap at a unique one of the potential values. The simultaneous closure of a plurality of switches applies the selected



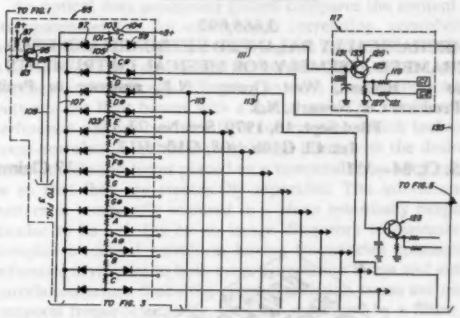
voltage to a pair of voltage-controlled oscillators so as to provide a two-voiced output determined by the two selected voltages having the greatest and least absolute amplitude values.

3,665,090

DEVICE FOR AUTOMATICALLY PRODUCING TONE PATTERNS BASED ON A TONIC NOTE

William Wangard, Maywood, and David W. Fleeton, Chicago, both of Ill., assignors to Walter E. Heller & Company, Chicago, Ill.

Filed May 11, 1970, Ser. No. 36,263
Int. Cl. G10f *1/00*
U.S. Cl. 84—1.03 **17 Claims**



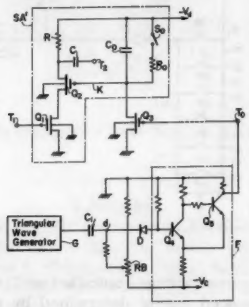
Electronically produced pulses are conveyed in predetermined patterns to a plurality of pedal gate circuits. Each of the pedal gate circuits includes a plurality of individual pedal gates equal to the number of semitones in a musical octave. Pedals operated by an instrumentalist are connected to one pedal gate in each of the pedal gate circuits. Audio gates are actuated by pulses from the pedal gates to pass tone generator signals to an output audio circuit. The pedal gates associated with a given pedal are each connected to different audio gates, the audio gates passing tone generator signals that produce tones related to one another in that they have as a tonic note that note represented by the pedal operated by the instrumentalist.

3,665,091

CONTROL CIRCUIT FOR SUSTAIN KEYER CIRCUIT IN ELECTRONIC MUSICAL INSTRUMENT

Katsuhiko Hirano, Hamakita, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Shizuoka-ken, Japan

Filed Apr. 9, 1970, Ser. No. 27,028
Claims priority, application Japan, Apr. 14, 1969, 44/28925
Int. Cl. G10h *1/02*
U.S. Cl. 84—1.26 5 Claims



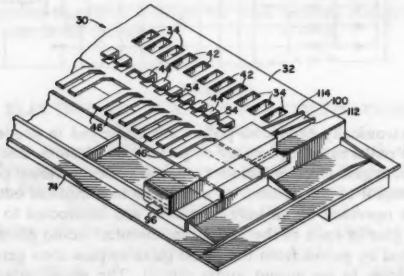
An electronic musical instrument has electronic keyers each including a time constant circuit containing a capacitor to give a sustain envelope to a switched tone signal. The improvement comprises: a switching element connected to the electronic keyer, said switching element being a field effect transistor and having a control electrode and another grounded electrode; and means connected to said control electrode for generating a relatively high frequency rectangular wave whose duty factor is variable, wherein by continuously varying the duty factor of the output signal derived from said rectangular wave generating means to control the control electrode of said switching element, a desired sustain time as well as the optimum auditory decay envelope characteristic are obtained.

3,665,092

MECHANICALLY BALANCED KEYBOARD AND REED CHAMBER ASSEMBLY FOR MUSICAL INSTRUMENTS

Udo G. Heiman, West Orange, N.J., assignor to Proll Products Co., Newark, N.J.

Filed Sept. 18, 1970, Ser. No. 73,332
Int. Cl. G10b *1/08*; G10c *3/12*
U.S. Cl. 84—351 17 Claims



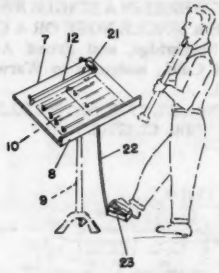
An air-operated musical instrument utilizing a unique keyboard and reed chamber assembly fabricated from relatively few, readily molded plastic components. The keyboard and reed chamber assembly are designed so that the keyboard, when secured to the reed chamber, is in mechanical balance or in equilibrium, therewith. Each key in the keyboard includes a forwardly extending finger pad, a rearwardly extending key stop, an intermediate pivot bar, a locking notch and an alignment notch. The reed chamber assembly includes a reed plate having a plurality of tuned reeds, a like plurality of resonance chambers having a port at the upper end of each chamber, a plurality of pivot posts, and a plurality of forwardly extending anchored springs. Each key is individually joined to the reed chamber assembly by snapping the pivot bar into locking engagement with a pivot post. The key stop then seals the port of the resonance chamber to block the passage of air therethrough. Depression of the finger pad of the selected key causes the key to pivot about the pivot bar and permits the passage of air through the selected resonance chamber, thus producing a musical tone.

3,665,093

PAGE TURNER FOR SHEET MUSIC AND THE LIKE

Joseph H. Machnacz, 12216 Aster Rd., Philadelphia, Pa.

Filed Sept. 3, 1970, Ser. No. 69,213
Int. Cl. G10g *7/00*
U.S. Cl. 84—487 3 Claims



This invention consists of a rectangular board having a longitudinally disposed upturned lower edge to prevent the sheet of music or the like that is placed on the board from sliding off. Two diametrically opposed spring clips on the board hold the music in place. An electric motor is located on the upper right hand corner of the board, the motor being provided with a pulley that has an endless cord encompassing the same, the cord also encompasses a free-turning pulley that is located on the opposite side of the board. A wire track is suitably mounted parallel to the just-mentioned cord. The purpose of the wire track is to provide a means of guiding a swivel fastener which is connected to the cord and also to a spring clip, the spring clip being secured to the sheet of music or page that is to be turned. A foot-operated switch, that is connected to an electric motor, completes the construction of this invention which is preferably mounted on a vertically disposed stand.

3,665,094

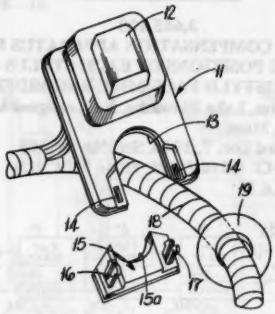
FUSE BOXES FOR ROAD VEHICLES

Benjamin William Matthews, Small Heath, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Nov. 10, 1970, Ser. No. 88,367
Claims priority, application Great Britain, Nov. 21, 1969, 57,036/69
Int. Cl. H02g *3/22*
U.S. Cl. 174—65 R 3 Claims

A fuse box comprises a synthetic resin body supporting fuse holders adapted to receive and make electrical connection to leads forming part of a cable harness, a groove being formed in the periphery of the body. The fuse box further in-

cludes a bridging member, co-operating latch means of the bridging member and the body adjacent said groove serving to releasably retain the bridging member on the body. The arrangement is such that in use the cable harness is accommodated in the groove and when engaged with the body the



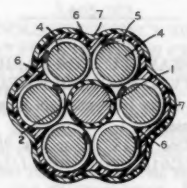
bridging member bridges the groove to provide a substantially circular aperture in the body. The harness passes through a grommet and the grommet engages in the aperture in the body to retain the harness in position relative to the body.

3,665,095

HIGH-STRENGTH NON-EXTENSIBLE CONDUCTIVE WIRE

Pierre Seguin, Chavanoz, France, assignor to Moulinage et Retorderie de Chavanoz, Chavanoz, France

Filed Oct. 6, 1970, Ser. No. 78,392
Claims priority, application France, Oct. 9, 1969, 6934485
Int. Cl. H01b 7/18
U.S. Cl. 174—107 **10 Claims**



A flexible, sealed, non-inflammable, low-weight, non-extensible conductive wire having great tensile and bending strength and resistance to friction comprising a core material composed of a very good conductor of electricity, this core material being electrically insulated; a sheath comprising a bundle of metallic wires that are either conductive or may be made conductive, this sheath having high strength; and a protective envelope comprising at least one coating layer. This high-strength, low-weight, non-extensible conductive wire is particularly well adapted for use in the remote control of rockets or in other applications where resistance to high temperature and high stress is necessary.

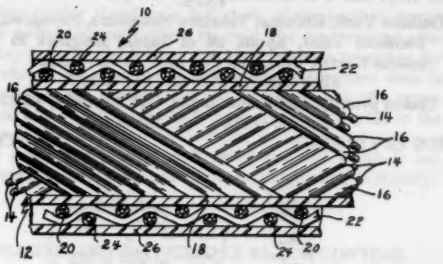
3,665,096

FLEXIBLE CABLE SHIELDING

Peter J. Madle, Torrance, Calif., assignor to The United States of America as represented by the Secretary of the Air Force

Filed May 4, 1971, Ser. No. 140,175
Int. Cl. H01b 7/18
U.S. Cl. 174—107 **8 Claims**

In a shielded multiple-conductor cable, a shield comprising parallel, longitudinal, convoluted wires symmetrically disposed around the conductor bundle, where the convoluted



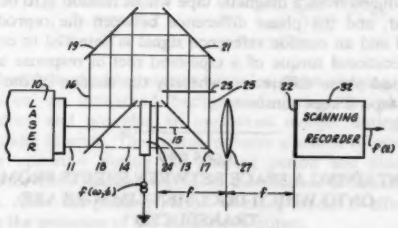
shield shape is maintained by means of inner and outer tie wraps.

3,665,097

OPTICAL DATA PROCESSING SYSTEM

Albert Macovski, Palo Alto, Calif., assignor to Stanford Research Institute, Menlo Park, Calif.

Filed July 25, 1969, Ser. No. 844,807
Int. Cl. H04n 5/30
U.S. Cl. 178—6 **12 Claims**

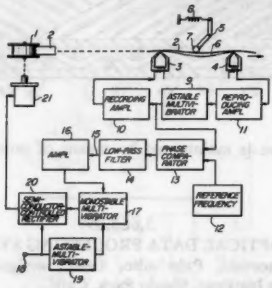


An optical data processing system compares the content of transparencies (as, for example, in correlating, convolving, and matched filtering) by combining the light transmitted by a first transparency with light transmitted by a second transparency and cyclically offsetting in time the relative phase between the light beams with a modulator. The resultant interference pattern contains light information which includes cross-correlation and auto-correlation terms with the desired cross-correlation terms placed on a temporal frequency carrier so that they are electrically separable. The interference pattern is temporally scanned in a plane essentially perpendicular to its axis (as by an image dissector) to generate a complex electrical waveform having frequencies containing information relative to both cross-correlation terms and auto-correlation terms. Since the cross-correlation terms are on a temporal frequency carrier, they are separated by a filter. A transparency may also be simultaneously compared to a plurality of other transparencies by cyclically temporally offsetting each of the reference light beams a different amount with a plurality of modulators. The desired cross-correlation terms with respect to each transparency are placed on a plurality of temporal frequency carriers which enables separation of desired terms from each other and from the undesired terms by filtering. In either case, the desired cross-correlation output from a filter may be utilized by a computer to provide the desired cross-correlation information. Alternatively, the desired cross-correlation information may be applied to cathode ray tube reproducers to form transparencies containing the desired information, and the transparencies thus formed utilized in a Fourier transform reconstruction apparatus to provide a visual display.

3,665,098
UNIT FOR CONTROLLING TENSION OF MAGNETIC TAPE

Osahiko Yano, Kadoma; Takahiro Nakamura, Neyagawa, and Toshiomi Yabu, Kyoto, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 7, 1970, Ser. No. 78,857
Claims priority, application Japan, Oct. 14, 1969, 44/82452
Int. Cl. G11b *15/43*; H04n *5/78*
U.S. Cl. 178—6.6 P 10 Claims

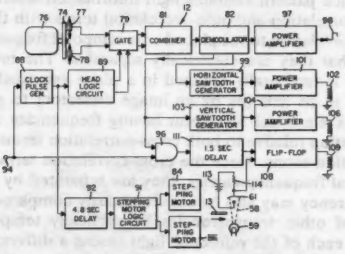


A unit for controlling the tension of a magnetic tape in which an output of a self-oscillator is recorded on and reproduced from a magnetic tape whose tension is to be controlled, and the phase difference between the reproduced signal and an outside reference signal is detected to control the rotational torque of a tape-feed reel in response to the detected phase difference, whereby the tension of the magnetic tape is kept constant.

3,665,099
MAINTAINING A SPACE BETWEEN SHEETS FROM AND ONTO WHICH DOCUMENT IMAGES ARE TRANSDUCED

Lawrence D. Emmons, Santa Clara, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Continuation of application Ser. No. 800,954, Feb. 20, 1969, now abandoned. This application Jan. 28, 1971, Ser. No. 110,614
Int. Cl. G03b *1/60*; H04n *1/12*, *1/28*
U.S. Cl. 178—6.7 R 16 Claims

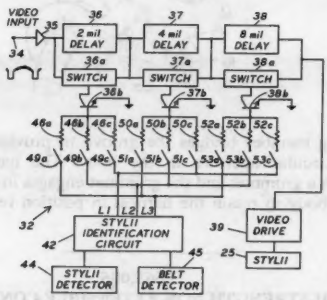


As a beam is deflected to transversely scan sheets as they are conveyed past the deflected beam for transferring image intelligence between a document image form on the sheet and a video signal form for processing by a video processing circuit, the beam is deflected in the direction of the travel of the conveyed sheets at a velocity relative to the velocity of travel of the sheets to produce complementary motion so that the entire sheet is scanned by the beam during a single frame video signal. The operations of the video processing circuit, sheet transport mechanism and beam deflection signal generator are time synchronized with the vertical synchronizing signal associated with the video signal such that each sheet is positioned at the location at which the first upstream line of the raster of scanned lines is produced when the deflections of the beam and transduction of the video intelligence signal is commenced.

3,665,100
AUTOMATIC COMPENSATION APPARATUS FOR THE MARKING POSITIONS OF EACH STYLUS OF A MULTISTYLII FACSIMILE RECORDER

Roger A. Pinkham, Lake Hiawatha, N.J., assignor to EG & G, Inc., Bedford, Mass.

Filed Dec. 7, 1970, Ser. No. 95,843
Int. Cl. G01d *15/06*; H04n *1/14*, *1/24*
U.S. Cl. 178—6.6 R 10 Claims

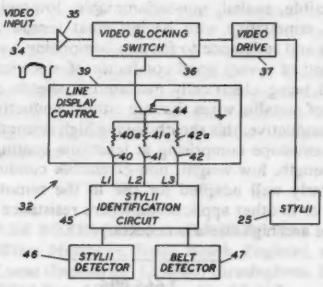


An automatic compensation apparatus is provided whereby the marking action of each stylus of a multistylii facsimile recorder may be compensated electrically for marking in proper alignment. Delay means is included switchable into the circuit responsive to control by a shift register pulsed by means rotatable with the stylii.

3,665,101
SWITCHING APPARATUS FOR EACH STYLUS OF A MULTISTYLII FACSIMILE RECORDER

Roger A. Pinkham, Lake Hiawatha, N.J., assignor to EG&G, Inc., Bedford, Mass.

Filed Dec. 7, 1970, Ser. No. 95,844
Int. Cl. G01d *15/06*; H04n *1/14*, *1/24*
U.S. Cl. 178—6.6 R 10 Claims

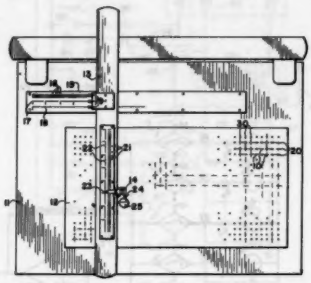


A switching apparatus is provided whereby the marking action of each stylus of a multistylii facsimile recorder may be observed separately from the marking action of the other stylii. Switching means makes it possible to block the marks of any one or all of the stylii so that in the event any stylus is making a mark out of alignment such stylus may be detected and adjustment made thereof.

3,665,102
X-Y COORDINATE LOCATOR

Vernon R. Townsend, Greenbelt, and Waldo M. Womeldorf, Hyattsville, both of Md., assignors to The Singer Company, New York, N.Y.

Filed Nov. 12, 1969, Ser. No. 876,009
Int. Cl. H04n 1/00
U.S. Cl. 178—18 3 Claims

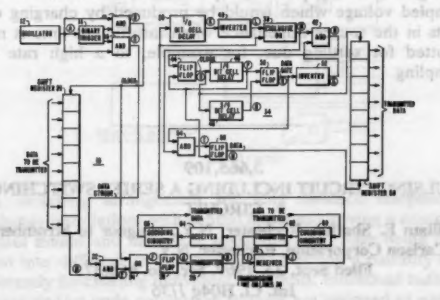


This device is a semiautomatic locator of any particular point on a surface by means of its X–Y coordinates. There are many situations where it is desirable to located a particular point on a large surface when only the X–Y coordinates of the point with respect to a datum are known. On a large surface, equipment of this type is necessary. This device comprises a support for the surface in question, two carriages, one movable along the X axis and the other along the Y axis, and electrical contacts on each carriage which cooperate with brushes on the carriages and are connected to registers to cause the registers to identify the X and the Y position of a pointer on the carriages at every instant. When the X–Y address of the point is registered, the pointer identifies that point on the surface.

3,665,103
SYNCHRONOUS FREQUENCY SHIFT DATA TRANSMISSION SYSTEM IN WHICH OPPOSITE BINARY CHARACTERIZATIONS ARE TRANSMITTED AS HALF CYCLES OF A FIRST CARRIER SIGNAL AND AS FULL CYCLES OF A SECOND CARRIER SIGNAL

Robert V. Watkins, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 16, 1969, Ser. No. 885,555
Int. Cl. H04l 27/12
U.S. Cl. 178—66 R 8 Claims

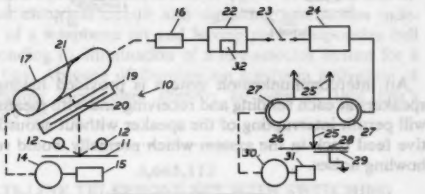


A data transmission system in which data to be transmitted is encoded using double frequency coding, the keying signal which defines the individual bit cells being in-phase with first and second carrier signals having frequencies equal to that of the keying signal frequency and twice that of the keying signal frequency. Opposite binary characterizations ("zeros" and "ones") are respectively transmitted as a half-cycle of the first carrier signal or a full cycle of the second carrier signal within the appropriate bit cells, the synchronous relationship between the keying and carrier signals providing for bit cells of equal size and self-clocking. Encoded data is processed at the transmitting and receiving ends of a transmission line by circuitry which is transformer coupled to the line at both ends to provide isolation and minimize common mode noise and ground shift problems, and which is impedance matched to the line to provide high noise immunity.

3,665,104
PHASING AND BACKSTROKE BLACK CONTROL CIRCUIT FOR FACSIMILE

Roger A. Pinkham, Lake Hiawatha, N.J., assignor to EG & G, Inc., Bedford, Mass.

Filed Dec. 7, 1970, Ser. No. 95,838
Int. Cl. H04n 1/02
U.S. Cl. 178—69.5 F 8 Claims

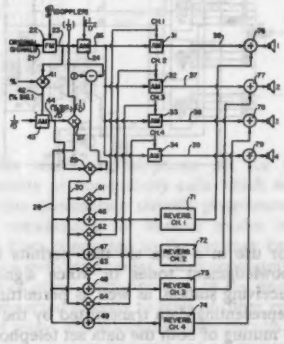


A facsimile marking circuit provides short phasing pulse marks on an unmarked background during the phasing operation, and provides an unmarked margin during the backstroke interval. The circuit includes a source of marking signals operative during the phasing period and blocking means for these marking signals in the absence of backstroke pulses. After the phasing period blocking means is effective during the presence of the backstroke pulses.

3,665,105
METHOD AND APPARATUS FOR SIMULATING LOCATION AND MOVEMENT OF SOUND

John M. Chowning, Stanford, Calif., assignor to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Filed Mar. 9, 1970, Ser. No. 17,747
Int. Cl. H04r 5/00; H03h 7/30
U.S. Cl. 179—1 G 12 Claims



A method and system for generating or processing music or sound signal information to provide, in addition to the

musical parameters of pitch, loudness, time, timbre, control over the apparent location and movement of the sound. The method and system controls the distribution of energy between loudspeakers to provide amplitude changes for the direct and reverberant signals and doppler shift to give the illusion of motion or arbitrary location in space of the sound produced by the loudspeakers.

3,665,106

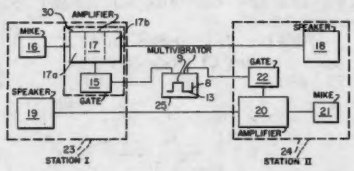
INTERCOMMUNICATION SYSTEM

Ram Parshad, New Delhi, India, assignor to Research Corporation, New York, N.Y.

Filed Apr. 28, 1970, Ser. No. 32,529

Int. Cl. H04m *1/20*

U.S. Cl. 179—1 FS **13 Claims**



An intercommunication system is provided having loudspeakers at each sending and receiving end with means which will permit interrupting of the speaker without acoustic positive feed back in the system which normally would result in howling noises.

3,665,107

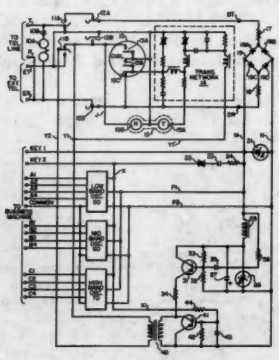
MONITORING CIRCUIT IN DATA SETS, WITH SIGNAL MUTING

Thomas J. Kopec, River Grove, and Richard A. Morstadt, Elmhurst, both of Ill., assignors to Automatic Electric Laboratories, Inc., Northlake, Ill.

Filed Nov. 13, 1970, Ser. No. 89,326

Int. Cl. H04m *1/06*

U.S. Cl. 179—4 **8 Claims**



A circuit for use in a data set that permits the user to monitor acknowledgment tones or voice signals from a distant data receiving station, as well as permitting monitoring of tones representing data transmitted by the user's own station. Signal muting of both the data set telephone receiver and an extension telephone are provided to limit the tone levels, as well as isolation from the telephone line to reduce impedance mismatching.

3,665,108

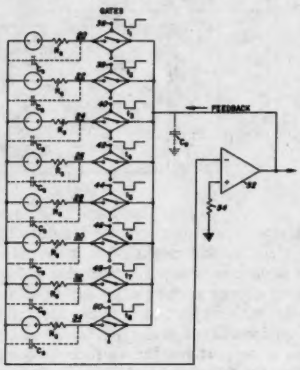
MULTIPLEXING SYSTEMS

John O. Bowers, Jr., Maitland, Fla., assignor to General Dynamics Corporation

Filed Oct. 20, 1969, Ser. No. 867,756

Int. Cl. H04j *3/02*

U.S. Cl. 179—15 BL **10 Claims**



A multiplexing system having high speed sampling capability, even in cases of high source impedance which would ordinarily cause errors which are a function of the source resistance and capacitance, is described. The system includes a plurality of commutator switches or gates which are connected in series with the sources. An operational amplifier is provided having a feedback path connected between the output and inverting input of the amplifier and including the series connected switches and sources. The direct input of the amplifier is connected to ground or some other voltage which is approximately equal to the return potential of the source. The output of the amplifier therefore is equal to the sampled voltage and the amplifier compensates for the errors in the sampled voltage which would be produced by charging effects in the source impedance when insufficient time is not allotted for settling due, for example, to a high rate of sampling.

3,665,109

PULSING CIRCUIT INCLUDING A SERIES SWITCHING CIRCUIT

William E. Shaffer, Rochester, N.Y., assignor to Stromberg-Carlson Corporation, Rochester, N.Y.

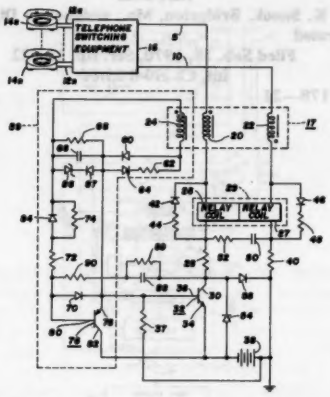
Filed Sept. 23, 1969, Ser. No. 860,375

Int. Cl. H04g *1/36*

U.S. Cl. 179—16 E **18 Claims**

A switching circuit is connected in series with a control device, such as a relay or a saturable reactor, and a direct current power source, across a pair of conductors adapted to be connected to a telephone line so that the circuit functions

as a pulsing circuit. A control circuit monitors the current flow in the series circuit to render the switching circuit momentarily non-conductive to briefly disconnect the power source when the telephone line is open circuited.

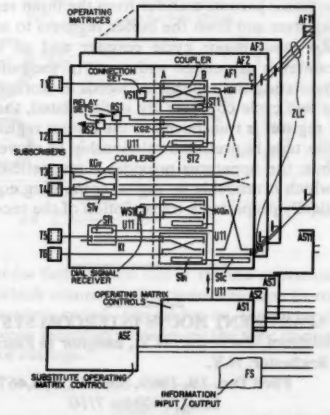


3,665,110

SWITCHING ARRANGEMENT FOR CENTRALLY CONTROLLED TELEPHONE EXCHANGE INSTALLATION

Peter Gerke, Grafelfing; Karl Rutkowski, Pullach; Helmuth Joachim Bock, Munich, and Helmut Palsa, Dachau, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Oct. 18, 1968, Ser. No. 768,753
Claims priority, application Germany, Oct. 19, 1967, P 15 37 849.1
Int. Cl. H04g *3/56*
U.S. Cl. 179—18 EA **6 Claims**



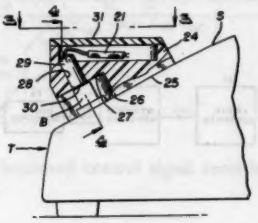
A switching arrangement for long distance telephone exchange installations with central apparatus having a central control means and individual apparatus, the latter being divided into different groups, each group having a plurality of differently functioning individual apparatus. Individual buffer storage and/or code conversion systems are assigned to each group and is connected thereto over a transmission line of a first type transmitting parallel coded information. Each group is connected over a joint transmission line of a second type having series coded information.

3,665,111

TELEPHONE USE MONITOR AND SIGNALLING APPARATUS

Warren J. Schieser, 483 Westmore Rd., Columbus, Ohio

Filed Aug. 13, 1970, Ser. No. 63,397
Int. Cl. H04m *1/22*
U.S. Cl. 179—81 C **12 Claims**



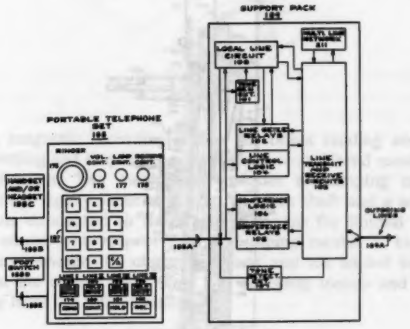
A monitor and signalling apparatus for a telephone set having illuminable line-selector buttons or indicator lights, or a switchboard equipped with indicator lights. The apparatus includes an electrical circuit and signalling mechanism independent of a telephone set and having photo-responsive cell for responding to illumination of a line-selector button for a specific line. Absence of illumination results in activation of the signalling mechanism thereby advising of that line's availability for use.

3,665,112

MULTI-LINE TELEPHONE SET WITH SWITCHING CAPABILITY

Richard K. Blake, Athens, and Haresh C. Jotwani, Morrow County, both of Ohio, assignors to North Electric Company, Galion, Ohio

Filed Aug. 25, 1969, Ser. No. 852,677
Int. Cl. H04m *1/00*
U.S. Cl. 179—99 **26 Claims**

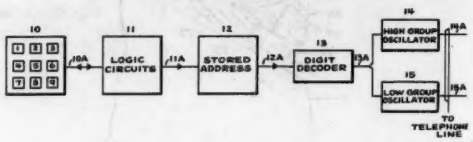


A four-wire multi-line telephone set for sending and receiving priority or non-priority calls which set includes a plurality of line termination circuits programmable by plug and socket connections for various modes of operation, whereby the lines connected to the set may be individually connected to a switching center either separately or in parallel with lines of other multi-line sets, or the lines may be individually connected directly to lines of other multi-line sets. A plurality of relays and associated logic circuits of the multi-line set establish separate transmit and receive paths for each line and conference connections between the lines connected to the set, or between lines of a plurality of multi-line sets.

3,665,113
TELEPHONE REPERTORY DIALER

Richard K. Blake, Athens; Robert J. deHilster, and Warren Wesley Porter, both of Gallion, all of Ohio, assignors to North Electric Company, Galion, Ohio

Filed Aug. 25, 1969, Ser. No. 852,661
Int. Cl. H04m *1/45*
U.S. Cl. 179—90 B 13 Claims

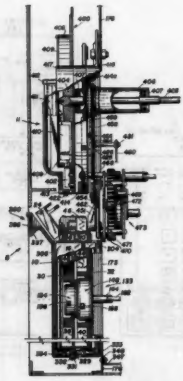


A solid state telephone repertory "dialer" including circuitry for generating pulses representative of the various digits in a selected directory number to be dialed, and directory number storage apparatus for routing the pulses over conductors representative of given digit values to circuitry which generates multifrequency digital signals representative of the digits of the selected directory number for use in setting up a communication path.

3,665,114
CARTRIDGE AND TAPE STRETCH PLACEMENT SYSTEM FOR VIDEO REPRODUCER AND/OR RECORDER

Richard A. Hathaway, Saratoga, Calif., assignor to Cartridge Television, Inc., New York, N.Y.

Filed June 26, 1970, Ser. No. 50,059
Int. Cl. G11b *5/52, 23/08*
U.S. Cl. 179—100.2 Z 7 Claims

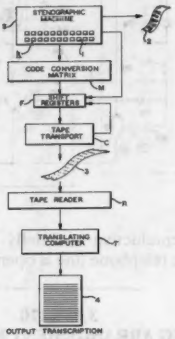


A tape transport apparatus of the type having a rotary head assembly and adapted for use with a tape cartridge. The apparatus includes a bucket for receiving a tape cartridge and for moving the same into an operative position adjacent to the rotary head assembly. Tape guides pull a stretch of the tape out of the cartridge and adjacent to the path of travel of the heads of the assembly. The bucket has means for releasing a reel brake in the cartridge. The apparatus includes means for opening a closure on the cartridge as the latter is moved by the bucket into its operative position.

3,665,115
STENOGRAPHIC APPARATUS PROVIDING A MAGNETICALLY RECORDED DIGITALLY ENCODED RECORD

Richard K. Snook, Bridgeton, Mo., assignor to Diginetics Incorporated

Filed Feb. 18, 1970, Ser. No. 12,322
Int. Cl. H04l *23/00*
U.S. Cl. 178—21 23 Claims



An apparatus for producing a magnetically recorded digitally encoded record when interfaced to a conventional key operated stenographic machine, responsive to the operation of such stenographic machine. The respective keys of the stenographic machine keyboard are interfaced to an electrical circuit of a recorder for producing a magnetic tape record. The recorder generally includes an input register and two internal buffer registers controlling information transfer rates between the keyboard and the magnetic tape unit. A clock oscillator permits transfer from the input register to the buffer registers and from the buffer registers to an output register. An input major cycle counter and an input minor cycle counter is associated with each of the buffer registers for accumulating the number of words in storage. As counts from the two cycle counters are accumulated, the input from a buffer register is transferred to the output register and written on the tape in pretimed relationship to movement of the tape. Thus, the apparatus provides a magnetically recorded record which is readable by digital computing equipment for automatically preparing a transcription of the record.

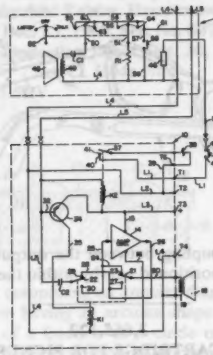
3,665,116
APARTMENT HOUSE INTERCOM SYSTEM

Allan Holstrom, Rochester, N.Y., assignor to Fasco Industries, Inc., Rochester, N.Y.

Filed Dec. 19, 1969, Ser. No. 886,467
Int. Cl. H04m *7/10*
U.S. Cl. 179—37 2 Claims

With this system only two wires are needed to transmit audio signals between a speaker-microphone unit located at a central or foyer station, and any one of a plurality of such units located at apartments remote from the foyer station. A transistorized relay at the central station normally connects the foyer unit for transmission to the remote units, but is responsive to a manually operable switch at each remote station to connect a selected remote unit for transmission to the foyer speaker. The same two wires are used to transmit a door unlatching signal from any remote unit to a release

mechanism at the foyer station. Also, a buzzer energizing signal may be transmitted from the foyer station over a single



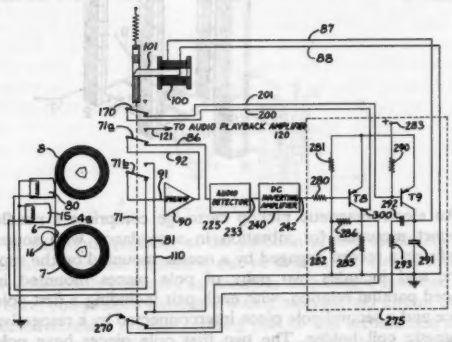
line selectively to one of two of the remote apartment stations.

3,665,117

TAPE CARTRIDGE APPARATUS INCLUDING A SILENCE RESPONSIVE POSITIONING CONTROL

Theophiel Clement Jozef Lodewijk Staar, Kraainem, Belgium, assignor to Staar, S.A., Brussels, Belgium

Filed June 12, 1969, Ser. No. 832,610
Claims priority, application Belgium, June 14, 1968, 716,590
Int. Cl. G11b *15/44, 23/04, 27/22*
U.S. Cl. 179—100.1VC **13 Claims**



A control for fast forward run or rewind operation of tape transports which automatically causes the tape to resume its normal operating speed, responsive to the detection of a silence between recorded passages on the tape during the fast movement of the tape.

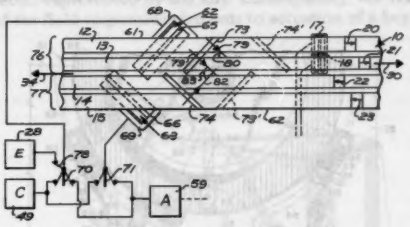
3,665,118

CONTROL SIGNAL RECORDING

Dexter P. Cooper, Jr., Pasadena, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Filed Apr. 7, 1969, Ser. No. 814,110
Int. Cl. G11b *5/48, 23/18, 23/36*
U.S. Cl. 179—100.2 S **5 Claims**

Improved methods and apparatus for magnetically recording control signals on magnetic recording tape to provide magnetic control signal records which extend over several recording channels at an angle thereto, or at an angle to another magnetic control signal record, or which are in the form of a chevron pattern, or which have the form of a series of magnetized regions aligned in a longitudinal direction of



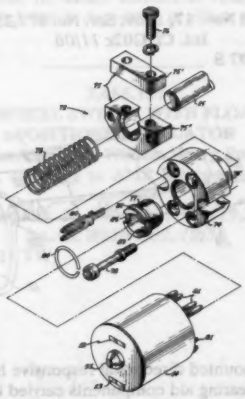
the tape; and improved control signal records provided by these methods.

3,665,119

MAGNETIC RECORDING DEVICE EMPLOYING NOVEL HEAD MOUNTING MECHANISM

Ansell W. Palmer, Hampton, and William C. Earl, Dover, both of N.H., assignors to Oktronics, Inc.

Filed June 23, 1969, Ser. No. 835,351
Int. Cl. G11b *5/54, 21/16, 25/04*
U.S. Cl. 179—100.2 T **6 Claims**



A magnetic recording device for ticket reading and interpreting and employing a novel read-record head mounting mechanism. The mechanism includes a clamping means which is rigidly secured to the rotatable shaft and a socket means connected to the clamping means for limited axial movement with respect to the clamping means. A biasing means between the clamping means and the socket means urges the socket away from the clamping means and thus away from the rotatable shaft.

3,665,120

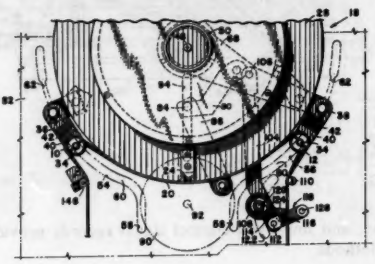
TAPE GUIDE SYSTEM HAVING PICK-UP ELEMENTS WITH CONICAL ENGAGING SURFACES FOR TAPE COURSE CONVERSION

Thomas J. Larkin, San Jose, Calif., assignor to Cartridge Television, Inc., New York, N.Y.

Filed June 26, 1970, Ser. No. 50,056
Int. Cl. G11b *15/66, 23/04*
U.S. Cl. 179—100.2 Z **5 Claims**

Apparatus for guiding a magnetic tape from a tape cartridge toward and into an operative position adjacent to and extending along a portion of a rotary head assembly. The apparatus includes a pair of tape pick-up elements or guides adapted to support the opposed ends of the stretch of tape

extending along the rotary head assembly. Each guide has a surface and a length sufficient to permit the tape to be pulled straight out of the cartridge and then toward and into operative position at which the tape forms a helix angle with the



arcuate path of travel of one or more heads of the rotary head assembly. The guides can be adjustably positioned on the means which mount the same for movement into and out of their operative positions.

3,665,121

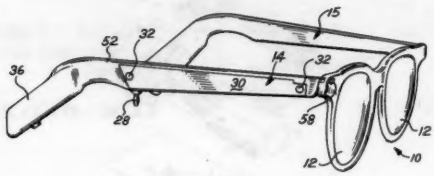
DIRECTIONAL RESPONSIVE HEARING AID

Erwin M. Weiss, Chicago, Ill., assignor to Beltone Electronics Corporation

Filed Nov. 17, 1969, Ser. No. 877,258

Int. Cl. G02c *11/06*

U.S. Cl. 179—107 S **2 Claims**



A spectacle mounted directional responsive hearing aid includes various hearing aid components carried in an earpiece of the spectacles. An elongated hollow sound conduit extends over a major portion of the longitudinal length of the earpiece, one end of the conduit communicating with a microphone enclosed in the earpiece and the other end of the conduit opening to the front of the spectacle lens carrying frame in a plane substantially tangent to the hearing aid user's forehead. The conduit is dimensioned to increase the frequency response of the hearing aid in a predetermined frequency range.

3,665,122

HEARING AID CONSTRUCTION UTILIZING A VENTED TRANSDUCER COMPARTMENT FOR REDUCING FEEDBACK

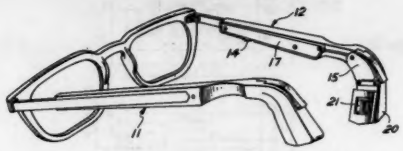
Erwin M. Weiss, Chicago, Ill., assignor to Beltone Electronics Corporation

Continuation-in-part of application Ser. No. 573,917, Aug. 22, 1966, now abandoned. This application Nov. 19, 1969, Ser. No. 878,194

Int. Cl. H04r *25/00*; G02c *11/06*

U.S. Cl. 179—107 BC **1 Claim**

A hearing aid construction in which the rigid hearing aid case is divided into at least two closely spaced compartments with a microphone mounted in one compartment and a output transducer mounted in the second compartment and further comprising means for venting acoustical pressure waves within the second compartment to substantially reduce



the acoustical coupling between the output transducer and the microphone positioned nearby within the rigid case.

3,665,123

CARTRIDGE FOR PICKUP

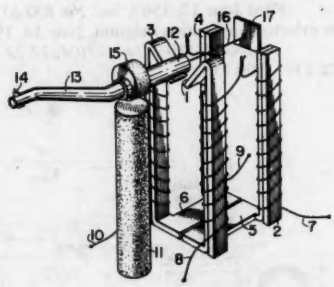
Kazuhiro Ikeda, Numazu, Japan, assignor to Messrs. Kabushiki Kaisha Mitachi Onkyo Seisakusho, Ohoka, Numazu-shi, Japan

Filed May 22, 1970, Ser. No. 39,613

Claims priority, application Japan, May 23, 1969, 44/47149; Apr. 18, 1970, 45/33191

Int. Cl. H04r *1/16, 9/12*

U.S. Cl. 179—100.41K **8 Claims**

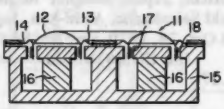


An electromagnetic pickup cartridge comprises a needle support mounted for vibration in accordance with sound tracks on a record engaged by a needle mounted on the support, and includes two pairs of pole pieces mounted in spaced parallel relation, with each pair including a first pole piece and a second pole piece interconnected by a respective magnetic coil holder. The two first pole pieces have pole faces at corresponding ends thereof in spaced relation with the support, and with the pole faces extending in perpendicular facing relation to each other. Respective coils embrace each pole piece, with the coil on each second pole piece being wound reversely relative to the coil on the associated first pole piece and connected in series therewith. Thereby, external magnetic fluxes are cancelled, with respect to each pair of pole pieces, so that high fidelity reproduction is provided in all channels of the record by the first pole pieces and the coils thereon in accordance with vibrations of the support relative to the pole faces. The support may comprise a paramagnetic metal tube in operative association with a fixedly position permanent magnet, or may comprise a tubular permanent magnet. Tension means are provided to preset the fulcrum of the support, and a mu-metal member is paced near the pole faces and the support to form a vertical compensation plate. From the physical standpoint, the pickup cartridge comprises a cartridge case mounting the pole pieces and a needle case mounting the needle support and readily assembled with the cartridge case.

3,665,124
LOUDSPEAKER HAVING ANNULAR DIAPHRAGM WITH DOUBLE VOICE COIL

Hiromi Sotome, Hamamatsu-shi, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Japan

Filed Dec. 23, 1969, Ser. No. 887,534
Claims priority, application Japan, Dec. 30, 1968, 43/96579
Int. Cl. H04r 9/06
U.S. Cl. 179—115.5DV 1 Claim

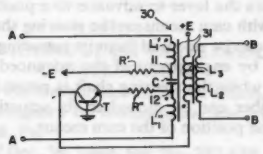


A loudspeaker comprising an annular diaphragm including a vibrating portion having an arcuate shape in cross section, such as a shape of a fraction of a circle or an ellipse, and inner and outer peripheral support portions, voice coils attached to borders between said vibrating portion and said inner and outer support portions of the diaphragm and magnetic circuit means having concentric gaps for receiving said voice coils, respectively, to drive the diaphragm in phase with said voice coils.

3,665,125
REPEATER WITH BIAS-COMPENSATING MEANS

Giuseppe Valbonesi, Milan, Italy, assignor to Societa Italiana Telecommunicazioni Siemens S.p.A., Milan, Italy

Filed June 17, 1970, Ser. No. 46,993
Claims priority, application Italy, June 18, 1969, 18,319 A/69
Int. Cl. H04b 3/36; H03f 3/62
U.S. Cl. 179—170 R 9 Claims



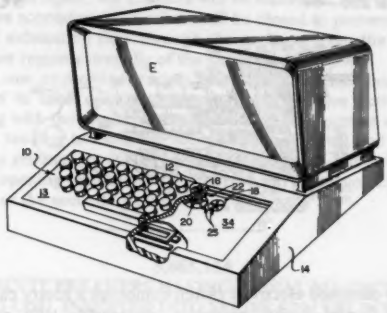
A telephone repeater at the junction of two reactively interconnected line segments, one of them a DC circuit with a predominantly inductive termination including a split coil on a core, comprises a transistor with a base/emitter circuit connected across a resistor forming part of this termination and with a compensating inductance in series with its collector wound on the same core in opposing relationship with the coil.

3,665,126
ELONGATED SWITCH BAR APPARATUS

William D. Gabor, Amherst, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Original application Oct. 10, 1966, Ser. No. 598,558, now Patent No. 3,588,875, dated June 28, 1971, which is a continuation of application Ser. No. 496,031, Oct. 14, 1965, now abandoned. Divided and this application July 1, 1970, Ser. No. 60,199
Int. Cl. H01h 9/26
U.S. Cl. 200—5 E 7 Claims

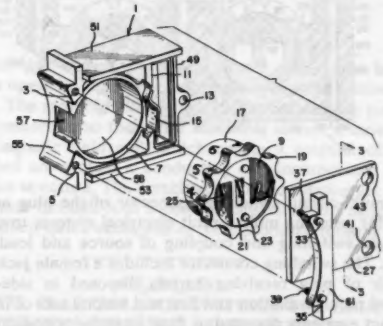
A keyboard encoder comprises a set of keys. Each key is in juxtaposition with one or more field-responsive elements associated with that key, the outputs of the field-responsive elements being conveyed to output terminals of the encoder. Actuation of a key alters the field to which the elements associated therewith respond. The number of elements associated with each key and the connections of these elements to the output terminals correspond to the output code for the character represented by the key. Consequently, the responses of the field-responsive elements to actuation of a key provide a directly encoded representation of the corresponding character at the output terminals. Also disclosed is an elongated switch bar in which contact is readily made even though the switch bar is depressed at either of the two ends thereof.



3,665,127
THUMBWHEEL SWITCH WITH FLOATINGLY POSITIONED ACTUATOR

Joseph Larue Lockard, and William Henry Rose, both of Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 26, 1971, Ser. No. 119,279
Int. Cl. H01h 9/02, 19/58
U.S. Cl. 200—11 TW 8 Claims

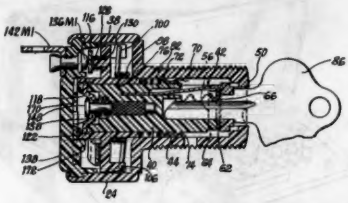


The disclosure relates to a thumbwheel switch wherein a brush with contact fingers is mounted on a contact wheel, the contact wheel being rotatable within a housing. A printed circuit board with discrete conductive sections is placed over the housing and contacts the contact fingers, the fingers abutting different predetermined ones of the conductive sections for each setting of the contact wheel to provide a coded output indicative of the positions of the contact wheel.

3,665,128
ELECTRICAL SWITCH HAVING ROTARY AND PUSH ACTIONS

William J. Schaad, Winnetka, and Fred N. Schmidt, Mukwonago, both of Wis., assignors to Indak Manufacturing Corp., Northbrook, Ill.

Filed Nov. 25, 1969, Ser. No. 879,690
Int. Cl. H01h 27/00
U.S. Cl. 200—44 8 Claims

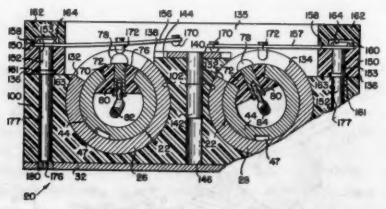


The disclosed electrical switch comprises a rotary carriage which carries a first contactor, engageable with contact points on the casing. An operating shaft is slidable through the carriage but is rotatable therewith. A second contactor is mounted on the shaft and has contact point elements engageable with contact sectors on the casing, when the shaft is pushed rearwardly. First springs are provided between the carriage and the first contactor. A second spring is disposed between the carriage and the shaft to bias the shaft forwardly. A third spring acts between the shaft and the second contactor so that it is yieldably mounted.

3,665,129
MULTI-CIRCUIT SWITCHING CONNECTOR

Jesse F. Lancaster, Great Falls, Va., assignor to Cooke Engineering Company, Alexandria, Va.

Filed June 23, 1964, Ser. No. 377,270
Int. Cl. H01r 19/50
U.S. Cl. 200—51.07 13 Claims

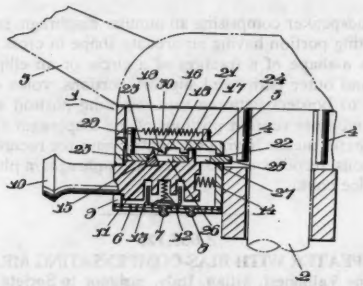


A multi-circuit switching connector of the plug and jack type for patching multi-circuit electrical systems to perform patched switching and coupling of source and load equipment. The switching connector includes a female jack having a pair of plug receiving barrels disposed in side-by-side spaced parallel relation and first and second sets of insulated contact elements disposed in fixed laterally opposed relation along the respective plug receiving barrels in rows parallel to the axes of the respective barrels for limited movement transversely of the barrel axes from a normal position establishing a through circuit between the opposed contacts; a pair of patching plugs each having a third set of mutually insulated contact elements disposed in longitudinally spaced relation axially of said plugs and arranged to respectively be engaged with the first and second set of contact elements; and coacting means on the respective plugs and the pair of plug receiving barrels orienting the plugs in predetermined angular relation for full entry into the barrels and rotation when fully inserted to patched engagement of the respective third sets of contact elements with the first and second sets of contact elements to selectively shift either or both of said first and second sets of contact elements from their normal positions to a shifted position to disrupt the through circuit and patch the circuits of the shifted contact elements through the associated patching plug.

3,665,130
HAZARD WARNING SWITCH FOR AUTOMOTIVE VEHICLES

Masaru Suzuki, Aichi, Japan, assignor to Kabushiki-Kaisha Tokai Rika Denki Seisakusho, Aichi-ken, Japan

Filed Oct. 28, 1970, Ser. No. 84,664
Int. Cl. H01h 3/16
U.S. Cl. 200—61.27 3 Claims

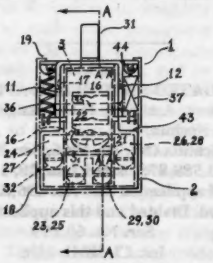


This switch is mounted adjacent a vehicle's steering shaft. It has a reciprocable actuating member resiliently biased away from the steering shaft, and a movable cancelling lever resiliently biased toward the shaft, but normally held in a retracted position by the actuating member. The actuating member can be pushed manually toward the shaft to an operative position where it closes a hazard warning circuit, and also allows the lever to advance to a position where it is engageable with cam means on the steering shaft. The actuating member can be released from its actuating position either manually or by engagement of the advanced lever with the cam means, when the steering shaft is rotated. Also, the actuating member can be moved to its actuating position regardless of the position of the cam means.

3,665,131
SNAP ACTION ELECTRIC SWITCH

Conan Henry Spaderna, 8 Edmund St., Longmeadow, Mass.

Filed Feb. 9, 1971, Ser. No. 113,957
Int. Cl. H01h 13/28
U.S. Cl. 200—67 B 10 Claims

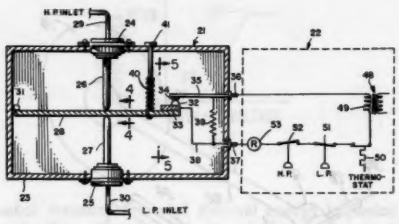


A snap action switch for alternating and direct current, improved by a solid support for the movable contact means in combination with a substantial distance between the stationary contacts. For longer life a robust spring mechanism is insulated against gas, arising from the arc.

3,665,132
PRESSURE-RESPONSIVE CONTROL DEVICE FOR ELECTRICAL CIRCUIT

Eugene Noel May, Aurora, Ill., assignor to J/B Industries, Inc., Aurora, Ill.

Filed Sept. 9, 1970, Ser. No. 70,716
Int. Cl. H01h 35/40
U.S. Cl. 200—83 D 9 Claims

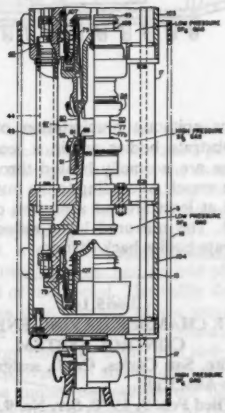


A control device is provided which is particularly suitable for use as a re-cycle control for air-conditioning and refrigeration systems. The device includes a pair of electrical contacts adapted to be connected in a series with the electrical control circuit of the system and a pair of pressure-responsive diaphragm pumps which open and close the contacts depending upon the relative pressures acting upon the diaphragms. An electrical resistance is connected across the contacts. When the pressure in one of the diaphragms exceeds the pressure in the other diaphragm by a predetermined amount, the contacts will be opened, although the electrical control circuit will be completed through the resistance. However, the resistance will decrease the current flow in the control circuit, and the current flow will not return to its original value until the differential between the pressures acting upon the diaphragms decreases to permit the electrical contacts to close, thereby effectively shorting the resistance out of the circuit.

3,665,133
DELAYED-ACTING BLAST VALVE OPERATOR CONSTRUCTION

Frank L. Reese, Pittsburgh, and Hayes O. Dakin, Jr., Irwin, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 30, 1968, Ser. No. 787,658
Int. Cl. H01h 33/54
U.S. Cl. 200—148 4 Claims



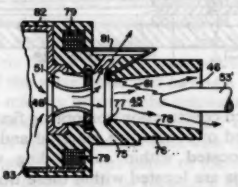
An arc-extinguishing unit is provided in a high-pressure gaseous environment having a pair of separable contacts, which when closed provide a primary blast valve, which prevents an exhausting flow of high-pressure gas through the interior of the contacts. Pneumatically connected with the interior of at least one of the separable contacts is a secondary blast valve, which is open in the closed-circuit position of the interrupting device. During the opening operation, upon separation of the separable contacts, the secondary blast valve begins to close, so that in the fully open-circuit position of the interrupter, the contacts will be separated, and the one or more secondary blast valves will be closed to prevent continued exhausting flow through the contacts from the high-pressure region externally of the contacts.

The one or more secondary blast valves are mechanically latched in their open position, and a blast-valve activator, moving with the moving contact structure, compresses spring means tending to close the secondary blast valve, and additionally releases the latches at a predetermined point of time in the opening operation to thereby permit a delayed closing action of the secondary blast valve.

3,665,134
CIRCUIT BREAKERS HAVING RADIAL MAGNETIC FIELD COIL INSERTED INTO SERIES CIRCUIT DURING THE OPENING OPERATION

William H. Fischer, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Original application Sept. 1, 1966, Ser. No. 576,707, now Patent No. 3,551,625. Divided and this application Mar. 16, 1970, Ser. No. 19,629
Int. Cl. H01h 33/70
U.S. Cl. 200—148 A 5 Claims



A fluid-blast circuit interrupter of the piston type has a movable operating cylinder carrying an orifice and a movable contact. The movable orifice structure has a movable probe, which connects into the series electrical circuit a movable radial magnetic field coil, which causes a rotation of the established arc around a conducting ring incorporated into the orifice structure. The combination of the rotating arc and the gas blast through both a side vent and an axially disposed orifice effects quick extinction of the established rotating arc.

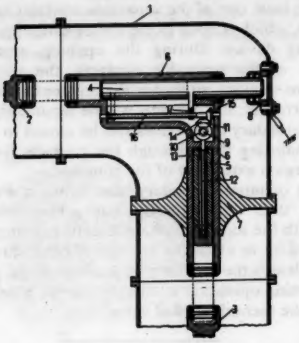
3,665,135
METAL CLAD ISOLATOR SWITCHES FOR HIGH TENSION AND DOUBLE INTERRUPTION

Rintje Boersma, Harmelen, and Gijsbert Waldemar Irik, Bilthoven, both of Netherlands, assignors to N. V. "COQ," Kanaalweg, Utrecht, Netherlands

Filed Aug. 7, 1970, Ser. No. 62,083
Claims priority, application Netherlands, Feb. 27, 1970, 7002803
Int. Cl. H01h 33/42, 31/32, 3/32
U.S. Cl. 200—163 12 Claims

A metal clad isolator switch for high voltage and double interruption, comprising two permanently electrically interconnected mechanically coupled, axially movable switching rods directed in respect of each other at an angle which is smaller

than 180° and each cooperating with their one end portion with an individual one of two insulatedly mounted fixed con-



tacts and at least one of said switching rods cooperating with its other end portion with a third fixed contact.

3,665,136

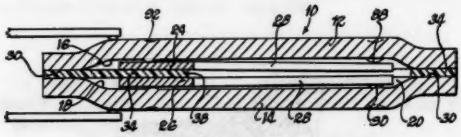
REED SWITCH CONSTRUCTION

Martin Gaber, 2301 Greenwood, Wilmette, Ill.

Filed Mar. 16, 1971, Ser. No. 124,682

Int. Cl. H01h *1/66*

U.S. Cl. 200—166 C **15 Claims**



A reed switch construction comprising first and second enclosures formed of conductive material and defining opposing troughs located within surrounding walls. First and second contacts are located within these troughs, and an insulating film is interposed between the respective assemblies of enclosures and contacts. An opening is defined by the film, and engaging portions of the respective contacts are positioned in opposing relationship adjacent this opening whereby the contacts can be moved into engagement when subjected to the influence of a magnetic field. The structure described permits accurate spacing of the contacts since the spacing is controlled by the film thickness.

3,665,137

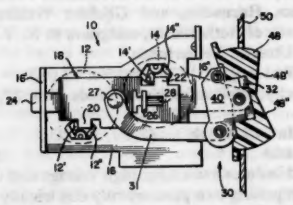
TWO SWITCH ACTUATOR MEANS

George O. Puerner, Frankfort, Ind., assignor to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Filed Nov. 4, 1970, Ser. No. 86,785

Int. Cl. H01h *3/04*

U.S. Cl. 200—172 A **8 Claims**



A pivotal actuator means having two pivot means is used to substantially simultaneously actuate two switches.

3,665,138

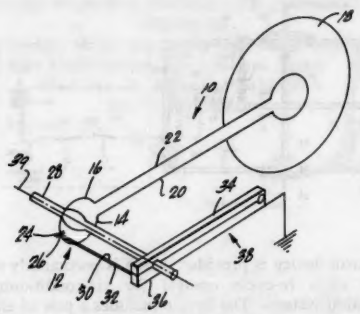
ANTI-ARC INDUCTION HEATING TOOL

Andrew F. Edge, Long Beach, and Masashi Hayase, Fountain Valley, both of Calif., assignors to McDonnell Douglas Corporation

Filed Feb. 22, 1971, Ser. No. 117,267

Int. Cl. B23k *13/02*

U.S. Cl. 219—8.5 **8 Claims**



An induction heating tool for welding or brazing tubes and their associated couplings and connectors wherein a split single turn inductor forms a heating chamber when the jaws thereof are closed and locked. When the jaws are opened or in otherwise poor electrical contact the contact surfaces thereof are maintained in electrical communication to prevent arcing thereacross.

3,665,139

DEVICE FOR EPITACTIC PRECIPITATION OF SEMICONDUCTOR MATERIAL

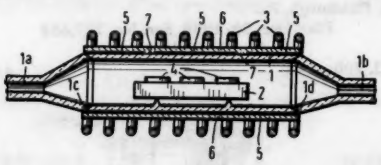
Hermann Steggewentz, Munich, Germany, assignor to Siemens Aktingesellschaft, Berlin and Munich, Germany

Filed May 12, 1970, Ser. No. 36,599

Claims priority, application Germany, May 16, 1969, P 19 24 997.9

Int. Cl. H05b *9/00*

U.S. Cl. 219—10.43 **9 Claims**



A device for epitactic precipitation of semi-conductor material on substrate bodies within a reactive vessel. The substrate bodies are normally heated through an induction coil outside the vessel. According to the invention a mirrored layer is placed at least around a portion of the wall of the reaction vessel. The mirrored layer reflects heat radiation from the substrate bodies back thereto.

3,665,140

MICROWAVE CHAMBER HAVING ENERGY DENSITY CONTROL SYSTEM

Jerome R. White, San Carlos, Calif., assignor to Varian Associates, Palo Alto, Calif.

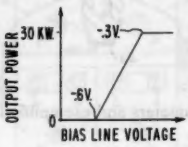
Filed Feb. 9, 1970, Ser. No. 9,769

Int. Cl. H05b *9/06*

U.S. Cl. 219—10.55 **7 Claims**

A microwave treating chamber is disclosed which includes a monitor for determining the average energy density of the

microwave field within the chamber and a feedback control system which responds to the monitor by maintaining the energy density within the chamber constant. The monitor includes a duct which extends a substantial distance through the chamber and through which water is passed at a constant rate. Thermistors in the duct on opposite sides of the



chamber measure the total thermal energy imparted to the water by the radiation within the chamber. This total energy gain provides a precise indication of the average energy density along the path of the duct of the microwave field. An electrical feedback loop from the monitor is included for controlling the intensity of the radiation fed to the chamber in order to maintain the energy density constant.

3,665,141

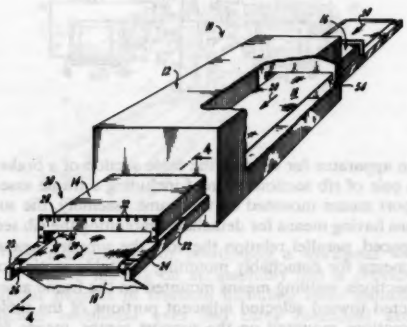
END TRAP FOR MICROWAVE OVEN

Robert F. Schiffmann, Brooklyn; Ernest W. Stein, and Harold B. Kaufman, Jr., both of New York, all of N.Y., assignors to DCA Food Industries, Inc., New York, N.Y.

Filed July 1, 1970, Ser. No. 51,531

Int. Cl. H05b *5/00*

U.S. Cl. 219—10.55 **14 Claims**



An end trap for a microwave oven. An enclosure defining a relatively high tunnel is disposed around a port of the oven. A conveyor moves through the port of the oven, and through and over the bottom of the tunnel. Along each side of the tunnel is a bracket, a metallic baffle plate being placed across the two brackets adjacent to the oven port. At the forward end of the tunnel, a slab of energy absorbing material is placed across the two brackets, and an end plate is secured to the forward end of the tunnel. The baffle defines a tunnel whose height is less than one-half of the wavelength of the energy at which the oven is operated to attenuate the leakage of microwave energy from the oven. The slab of energy absorbing material is provided to absorb any energy which does escape through the tunnel defined by the baffle plate. To clean the tunnel, all that is required is to remove the end plate, and then the slabs of energy absorbing material and the baffle plate.

3,665,142

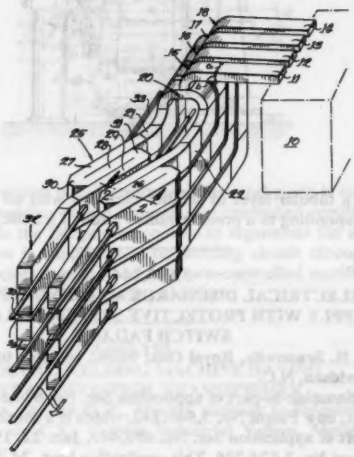
SYSTEM FOR APPLYING MICROWAVE ENERGY TO A LOSSY CYLINDRICAL OBJECT

Ray M. Johnson, Danville, Calif., assignor to Cryodry Corporation, San Ramon, Calif.

Filed July 6, 1970, Ser. No. 52,505

Int. Cl. H05b *9/06*

U.S. Cl. 219—10.55 **13 Claims**



In a system for heating lossy dielectric cylindrical objects, for example in pre-cooking Vienna sausage, a wave guide of rectangular cross section is excited in the TE_{10} mode to generate an electric field extending perpendicularly between the broadwalls of the wave guide and having a maximum intensity in a plane midway between the sidewalls extending in the direction of power flow. The cylindrical object is then passed through the opposing broadwalls with the axis of the object extending generally in the plane of maximum field intensity, forming an acute angle of incidence in the range of 15° to 80° with the axis of the guide. The angle depends on the dielectric constant and loss factor of the object, and it is set to reduce reflection back to the microwave source yet increases heating of the object and provides a more uniform heating of its surface. In a preferred embodiment the wave guide is folded back upon itself to provide a meander system with the object making three passes through each wave guide applicator.

3,665,143

METHOD OF CONSTRUCTING SUBSTANTIALLY CIRCULAR CROSS-SECTION VESSEL BY WELDING

Akira Ujiie, Kobe-shi, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 23, 1970, Ser. No. 5,311

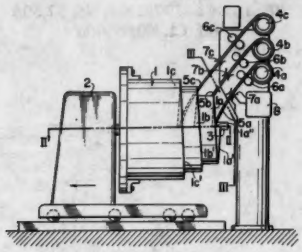
Claims priority, application Japan, Jan. 31, 1969, 44/6624

Int. Cl. B23k *9/04*

U.S. Cl. 219—76 **5 Claims**

A multi-layer, thick wall, substantially circular cross-section metal vessel includes a plurality of concentric tubular layers formed by the progressive deposition of molten weld metal mainly provided by electroslag welding process to form continuous helical strips with the axially adjacent convolutions of each helical strip being contiguous. The several helical strips are formed simultaneously, and each helical strip is solidified in contact with solidified metal. Each strip of mol-

ten metal forming a tubular layer of a relatively larger diameter is deposited progressively and progressively solidified



onto a tubular layer of smaller diameter with an axial offset corresponding to a predetermined pitch of a helix.

3,665,144

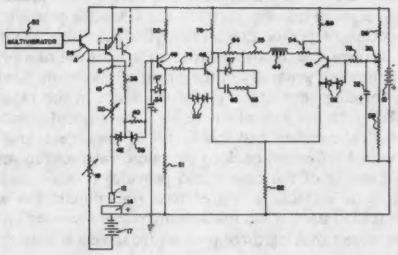
ELECTRICAL DISCHARGE MACHINING POWER SUPPLY WITH PROTECTIVE SYSTEM FOR OUTPUT SWITCH FAILURE

Kurt H. Sennowitz, Royal Oak, Mich., assignor to Elox, Inc., Davidson, N.C.

Continuation-in-part of application Ser. No. 874,574, Nov. 6, 1971, now Patent No. 3,548,142, which is a continuation-in-part of application Ser. No. 699,443, Jan. 22, 1968, now Patent No. 3,524,036. This application Sept. 24, 1970, Ser. No. 74,997

Int. Cl. B23p *1/08, 1/14*

U.S. Cl. 219—69 G 3 Claims



A protective system for an electrical discharge machining power supply circuit including a periodically operated electronic output switch or bank of output switches and a drive stage therefor. A network is connected between the output stage and the gap. Responsive to failure of one or more of the output switches and short circuiting of the gap, the remainder of output switches are biased off. Concomitantly, there is an interruption of down-feed signal in the servo control circuit causing a back-off of the servo system until the "failed" switch is replaced in the circuit.

3,665,145

RESISTANCE WELDING ELECTRODE

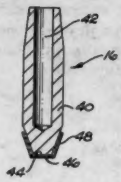
Harold J. Engel, 8127 Matilya Ave., Panorama City, Calif.

Filed Apr. 10, 1970, Ser. No. 27,398

Int. Cl. B23k *9/24*

U.S. Cl. 219—119 10 Claims

The useful life of a resistance welding copper electrode is significantly extended by plating on its tip a material having



certain defined parameters and exemplified by nickel, beryllium, cobalt and iron.

3,665,146

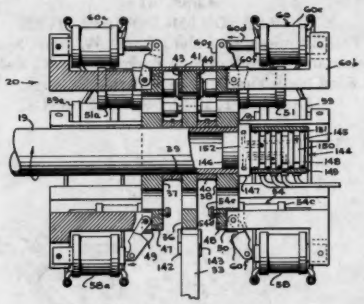
APPARATUS FOR WELDING BRAKE SHOES

Thomas B. Morris, Montgomery; Fred Paul, Prattville, and Barney R. Powell, Montgomery, all of Ala., assignors to Standard Forge and Axle Company, Inc.,, Montgomery, Ala., by said Barney R. Powell

Filed Jan. 23, 1970, Ser. No. 5,199

Int. Cl. B23k *9/12*

U.S. Cl. 219—124 15 Claims



An apparatus for welding the table section of a brake shoe to a pair of rib sections thereof including a frame assembly, support means mounted on the frame assembly, the support means having means for detachably mounting the rib sections in spaced, parallel relation thereon, the support means having means for detachably mounting the table section on the rib sections, welding means mounted on the frame assembly, directed toward selected adjacent portions of the table and rib sections mounted on the support means, means for advancing the support means along a predetermined line of travel whereby the welding means is directed toward the selected portions of the table and rib sections, and means for energizing the welding means to weld the table and rib sections together.

3,665,147

DEVICE FOR ELECTRICAL PROTECTIVE GAS WELDING

Karl Schobel, Frankfurt am Main, and Werner Becker, Bornheimer, both of Germany, assignors to Messer Griesheim GmbH, Frankfurt am Main, Germany

Continuation-in-part of application Ser. No. 643,862, June 6, 1967. This application Mar. 18, 1970, Ser. No. 20,653

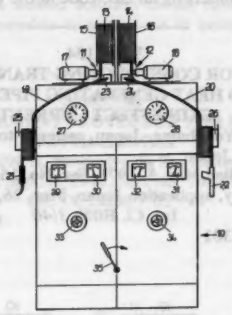
Int. Cl. B23k *9/10*

Claims priority, application Germany, June 10, 1966, M 69793

U.S. Cl. 219—131 R 2 Claims

An electrical protective gas welding device for seam weld-

ing a plurality of layers together with different thickness wires mounts both the wire supply devices and the corresponding torches on the same electrical equipment housing for sequential operation thereof.

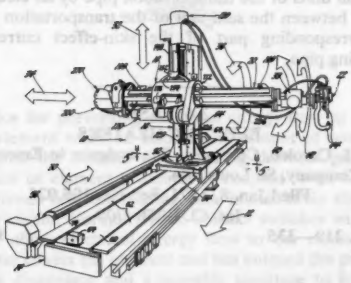


3,665,148

SIX-AXIS MANIPULATOR

Richard W. Yasenchak, Farmington; Raymond A. Schomer, Royal Oak, and Ernest V. Harper, Utica, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 7, 1971, Ser. No. 132,062
Int. Cl. B23k 9/12
U.S. Cl. 219—125 4 Claims



A six-axis manipulator for positioning a workhead with respect to articles moving on an assembly line is provided with multiple degrees of freedom including three mutually perpendicular rectilinear axes and three rotational axes. Electric servo motors and precision ball screw drives coordinately position the workhead about the rectilinear axes for achieving primary orientation of the workhead and a precision chain drive and a dual input, single output differential gear unit universally position the workhead about the rotational axes for achieving secondary orientation in a desired work processing relationship with the articles.

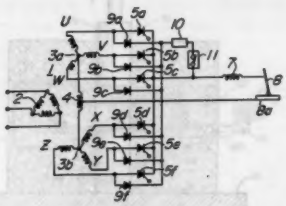
3,665,149

DIRECT-CURRENT ARC WELDER

Akira Sakabe, Urawa, and Kinji Sugimoto, Tokyo, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 9, 1970, Ser. No. 17,569
Claims priority, application Japan, Mar. 19, 1969, 44/20362
Int. Cl. B23k 9/10
U.S. Cl. 219—131 R 2 Claims

A direct-current arc welder comprising a transformer having its primary winding connected to an AC power source, controlled rectifier elements respectively connected between the secondary winding of said transformer and a welding circuit including an electrode and a workpiece and series circuits respectively consisting of non-controlled rectifier elements and a current-limiting element and each being connected across the anode and cathode of said each controlled rectifier element, whereby the DC power necessary to maintain an arc between the electrode and the workpiece is supplied to said welding circuit through said controlled rectifier elements, while the DC power required to regenerate the arc after extinction is supplied to said welding circuit through said series circuits consisting of said non-controlled rectifier elements and said current-limiting element.

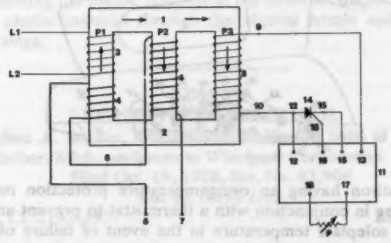


3,665,150

ELECTRICAL WELDING MACHINE HAVING AMPERAGE CONTROL TRANSFORMER

Salvador Mejia, Mexico D. F., Mexico, assignor to Industrias Sigma, S.A. de C.V., Colonia Industrial Vallejo, Mexico, D.F., Mexico

Filed Sept. 18, 1970, Ser. No. 73,275
Claims priority, application Mexico, Nov. 21, 1969, 115,484
Int. Cl. B23k 9/10; H01f 40/08
U.S. Cl. 219—131 WR 4 Claims



An arc welding unit operable on single or multiple phase alternating current and including for each phase a basic control device including a three-legged magnetic core. A primary leg includes a portion of the secondary, or output, winding, the remainder of which is wound on a secondary leg of the core. Flux through the secondary leg is controlled by regulating the duty cycle of the saturation current through a control winding on the third leg of the core, and flux-induced emf in the secondary winding due to current flow through the control winding is essentially eliminated because the secondary is formed on both the primary and secondary legs.

3,665,151

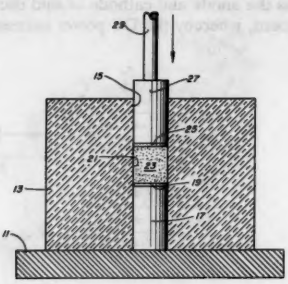
APPARATUS FOR PREVENTING CARBON DIFFUSION IN ELECTRIC DISCHARGE SINTERING

Thomas E. Piper, Los Altos, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed July 24, 1969, Ser. No. 844,351
Int. Cl. B23f 3/10; C22c 25/00
U.S. Cl. 219—149 3 Claims

An apparatus for sintering metallic particles to form coherent objects wherein an electric spark is developed

between slightly compacted particles disposed in a mold. A carbon diffusion barrier is provided between a pair of electrodes and the particles in the mold to prevent diffusion of carbon into the mold.



3,665,152

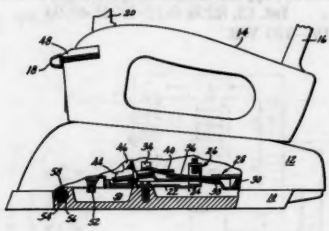
IRON WITH OVERTEMPERATURE PROTECTION MEANS

Harold S. Foster, Huntington Beach, and Wendell C. Walker, Alta Loma, both of Calif., assignors to General Electric Company

Continuation-in-part of application Ser. No. 880,053, Nov. 26, 1969, now abandoned. This application May 20, 1971, Ser. No. 145,177

Int. Cl. D06f *75/26*

U.S. Cl. 219—253 **12 Claims**



A flatiron having an overtemperature protection means operating in conjunction with a thermostat to prevent an excessive soleplate temperature in the event of failure of the thermostat.

3,665,153

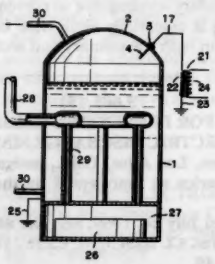
APPARATUS AND METHOD FOR HEATING WATER

Yukichi Asakawa, Tokyo, Japan

Filed May 11, 1970, Ser. No. 35,964

Int. Cl. F27d *11/00*

U.S. Cl. 219—279 **10 Claims**



An apparatus and method for heating water to generate steam or provide hot water. The water is heated by a conventional heat source and is simulataneously subjected to an electric field. In a steam generator the field is produced by an electrode in the steam chamber. In a water heater the field is produced by immersing an electrode in the water.

3,665,154

METHOD FOR CONSTRUCTING TRANSPORTATION PIPES AND HEAT GENERATING PIPES UTILIZING SKIN-EFFECT CURRENT

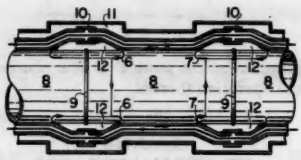
Masao Ando, Yokohama, Japan, assignor to Chisso Corporation, Osaka, Japan

Filed Mar. 5, 1970, Ser. No. 16,788

Claims priority, application Japan, Mar. 26, 1969, 44/22974

Int. Cl. H05b *3/40*

U.S. Cl. 219—301 **5 Claims**



Units of transportation pipes heated by the skin-effect current flowing concentratedly only through the inner wall skin portion of a ferromagnetic pipe in which an insulated conductor line forming a primary circuit is placed to pass AC therethrough are constructed by electrically connecting the skin-effect current heat-generating pipes at all connecting parts of the transportation pipe so as to form a secondary circuit in all units of the transportation pipe by an electric connection between the said unit of the transportation pipe and the corresponding part of the skin-effect current heat-generating pipe.

3,665,155

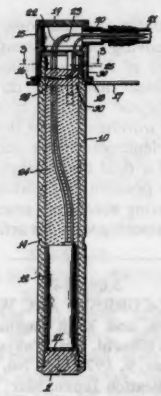
ELECTRIC HEATERS

Steven J. Caroleo, Corapolis, Pa., assignor to Emerson Electric Company, St. Louis, Mo.

Filed Jan. 8, 1971, Ser. No. 105,021

Int. Cl. H05b *1/00*

U.S. Cl. 219—335 **10 Claims**



A heater for use in a highly corrosive environment such as, for example, for heating pickling solutions, plating baths and the like, comprising an imperious graphite sheath, an electric heating element within the lower end of the sheath, granular refractory material within the sheath, an epoxy cement

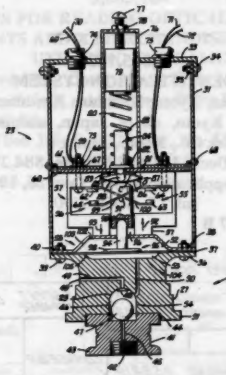
topping the refractory material and encapsulating a grounding plate which is in electrical engagement with the interior wall of the sheath, the entire heater being resistive to corrosive action of the heated solution or the fumes therefrom, and including a member to permit air to enter or exit from the sheath.

3,665,156

HEATING-ELEMENT PROTECTOR FOR ELECTRIC WATER-HEATER

Herbert P. Lee, 7490 N. Pennsylvania St., Indianapolis, Ind.

Filed Sept. 8, 1970, Ser. No. 70,240
Int. Cl. H05b *1/02*
U.S. Cl. 219—333 8 Claims



A device for preventing electrical energy flow to a water heating element when an insufficient amount of water is in contact with the element for absorbing the heat generated. The device or element protector is coupled to an exit pipe which extends into the heating tank immediately above the heating element. Normally open contact switches within the protector allow electrical energy flow to the element only when water covers the element and has entered the protector causing a diaphragm and a movable structure to force the switches closed. A helical spring and snap disc are employed to allow the switches to close and open at different pressure points. Means are provided to adjust the spring for different operating pressures. A float and chamber within the protector prevent switch activation when water does not cover the heating element.

3,665,157

METHOD OF PRODUCING A MOISTURE PERMEABLE SHEET MATERIAL

Kazuto Harada, Kurashiki, Japan, assignor to Kuraray Co., Ltd., Kurashiki, Japan

Filed Feb. 19, 1971, Ser. No. 117,143
Claims priority, application Japan, Feb. 17, 1970, 45/17481; June 12, 1970, 45/51403
Int. Cl. H05b *7/18*
U.S. Cl. 219—384 19 Claims

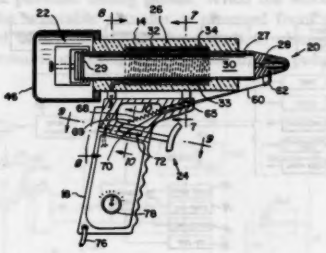
A method of imparting moisture permeability to a sheet material having a porous base and a non-porous surface layer is provided comprising impregnating the pores within the porous base with an aqueous medium, subjecting the impregnated sheet material to electrical discharge, thereby forming a plurality of perforations in said non-porous surface layer, and recovering the sheet material exhibiting enhanced moisture permeability.

3,665,158

PLASTIC EXTRUSION DEVICE

Don T. Froedge, 407 Cleveland Ave., Glasgow, Ky.

Filed July 31, 1970, Ser. No. 59,936
Int. Cl. F27d *14/00*
U.S. Cl. 219—421 13 Claims



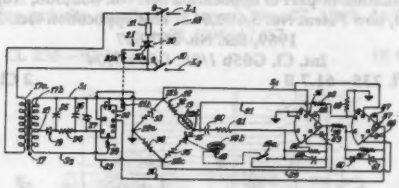
The device, in the form of a hand gun, includes a chamber for receiving plastic material and a nozzle assembly disposed along the gun barrel. The nozzle assembly includes a conical element having an eccentric opening. This conical element is rotatable between positions misaligning and aligning the eccentric opening with a similar eccentrically disposed opening in the barrel in communication with the chamber. An access cover is provided for the chamber whereby it can be loaded with plastic material. Heating elements are disposed about the chamber and a trigger assembly is connected to a wire for rotating the conical nozzle element. In operation, the plastic material in the chamber is heated. When the nozzle element is rotated into a position aligning its opening with the barrel opening by actuation of the trigger, the pressure generated by heating the plastic material in the chamber displaces molten plastic material through the aligned nozzle and barrel openings.

3,665,159

HEATING SYSTEM CONTROL

Stephen A. Becker, and Donald E. Knoop, both of Benton Harbor, Mich., assignors to Whirlpool Corporation

Filed Oct. 19, 1970, Ser. No. 81,900
Int. Cl. H05b *1/02*
U.S. Cl. 219—497 13 Claims

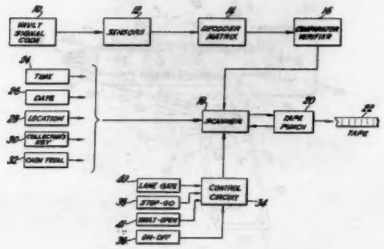


A control for regulating an electric heater of a heating system to provide substantially maximum rate of elevation of the system temperature at start-up without overshooting a preselected temperature to which the system is to be heated. The control includes means for sensing the instantaneous difference between the system temperature and the preselected temperature and for performing control operations based on the sensed temperature information to provide the desired control of the heater. The control may be further arranged for selective use as an infinite heat control as desired.

3,665,160
CODED SECURITY VAULT

Herman Lopata, New Rochelle, N.Y., assignor to Automatic Toll Systems, Inc., Bronx, N.Y.

Filed Dec. 18, 1970, Ser. No. 99,596
Int. Cl. G06k 1/18, 7/01; E05g 3/00
U.S. Cl. 235—61.1 **9 Claims**

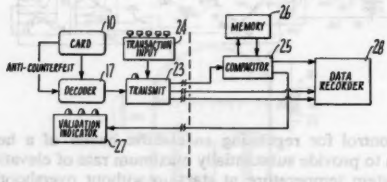


A vault into which cash, such as coins and tokens are deposited, is provided with a self-locking enclosure to be opened only by authorized personnel in preferably supervised facilities at which the contents are counted and accounted for. The vault is generally of a parallelapiped form adapted for slidable insertion in a drawer provided with an access port for conveying the cash therein. Mechanical, magnetic, optical or electronic means are provided as an adjustable code for identification of the vault. Means to sense the identification code on the vault are provided in the drawer housing and are so arranged as to prevent access by unauthorized personnel. A control circuit responsive to signals representative of the coded vault are processed by appropriate scanning and comparator circuits and, depending upon the code used, conversion matrices to develop a printout of the identified vault at a remote location upon the occurrence of certain actions such as the insertion, removal of the vault from the drawer or at some programmed interval on the hour or the like. In a preferred application the coded self-locking vault is included in a toll collection system for toll roads and toll bridges wherein the output is punched into a tape for translation at accounting centers in any desired printed form.

3,665,161
CARD READOUT SYSTEM

George S. Oberhart, San Mateo, Calif., assignor to Albert J. Day

Continuation-in-part of application Ser. No. 855,868, Aug. 4, 1969, now Patent No. 3,600,012. This application Oct. 20, 1969, Ser. No. 867,567
Int. Cl. G05b 1/08; G06k 7/04
U.S. Cl. 235—61.7 B **2 Claims**

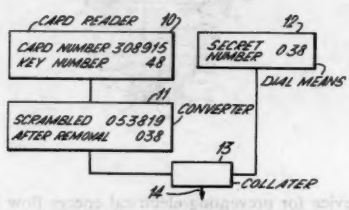


A system employing encoded cards and a card readout machine wherein the cards incorporate both embossments and electrically conductive means which cooperate with said machine to read out information encoded on individual cards. The readout machine which is employed in the system may be adapted for either "on line" usage with a computer or perform "off line" functions. In the latter arrangement the readout machine incorporates means to punch a memorized code thereinto, means to read encoding embossments on a card and means including electrical circuitry to determine for card verification purposes whether or not embossment encoding on the card complements the combination punched into the machine. The off line machine further includes means cooperating with electrically conductive encoding means on the card to determine whether or not the card is counterfeit. The on line machine incorporates means for reading a card encoded with both embossments and printed circuitry and for feeding the encoded information to an electronic data processing (EDP) center. In addition, the on line machine may be utilized to feed to the EDP center information relating to such matters as the location of the machine, the amount of money being charged and/or information regarding the source of the card being utilized in combination with the machine.

3,665,162
IDENTIFICATION SYSTEM

Mititaka Yamamoto, Kyoto; Kazuhiro Kawahara, Hyogo, and Tadao Morita, Kyoto, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Dec. 11, 1969, Ser. No. 884,270
Claims priority, application Japan, Dec. 16, 1968, 43/92201
Int. Cl. G06k 9/00
U.S. Cl. 235—61.7 B **4 Claims**



A system for identifying the proper user of a credit card or the like in a vending machine or the like. Each card used in the system is given an identification number and a key number both written on the card and a secret number previously known to the proper owner of the card. To make the secret number, the order or arrangement of the numerals constituting the identification number is changed or scrambled in accordance with a program as determined on the basis of the key number, and from the scrambled identification number some of the component numerals are removed in accordance with a program as determined on the basis of the key number, so that the remaining numerals are formed into the secret number of the card. When the card is used for a credit purchase, the system recognizes the secret number of the card from its identification number and key number in accordance with the above-mentioned programs, and then compares that secret number thus recognized with the secret number separately entered into the system by the user of the card. If the two secret numbers are found identical, the system recognizes the user of the card as its proper owner.

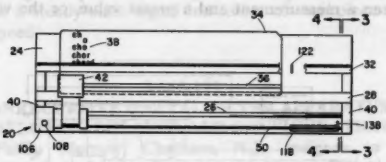
3,665,163
DRIVE AND CONTROL MEANS FOR EDUCATIONAL DEVICES SUCH AS CARD READERS AND THE LIKE

Gifford M. Mast, and Lloyd E. Moeller, both of Davenport, Iowa, assignors to Mast Development Company, Davenport, Iowa

Filed Feb. 16, 1970, Ser. No. 11,381
Int. Cl. F16d 21/00; G06k 7/00; G11b 5/00
U.S. Cl. 235—61.11 D **8 Claims**

Drive and control mechanism of a reversible character for positively driving a "reading" head in advance and return

phases so as to avoid the use of return springs, including, in particular, a transmission including a unitary inner- and outer-periphery wheel means and selective stops responsive to cards of different lengths.

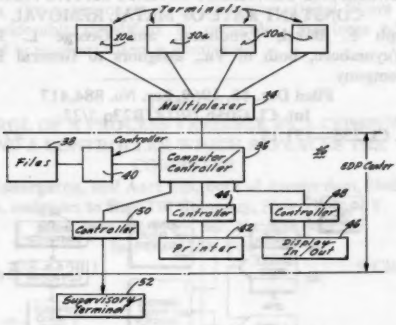


3,665,164

APPARATUS FOR READING OPTICALLY CARDLIKE ELEMENTS AND A MERCHANDISING SYSTEM UTILIZING THE SAME

Robert W. Beveridge, Costa Mesa; Felix Macaluso, Fountain Valley, both of Calif., assignors to Ricca Data Systems, Inc., Santa Ana, Calif.

Filed July 9, 1970, Ser. No. 53,473
Int. Cl. G06k 7/10
U.S. Cl. 235—61.11 E **10 Claims**



Apparatus for optically reading flat elements such as merchandise tickets and credit cards in which holes have been punched to encode information. When the element is properly indexed, the reading is accomplished by directing light against the element disposed against an opaque panel in which are embedded ends of light conductive fibers in a pattern such as to provide a fiber end in registry with every possible hole position in the element. The fibers extend to another opaque panel where their other ends are disposed in registry with a bank of phototransistors. Electronic means are connected to decode the current impulses produced by phototransistors as they receive light from the second fiber ends. The merchandising system employs this apparatus to read in sequence both Kimball type merchandise tickets and special credit cards.

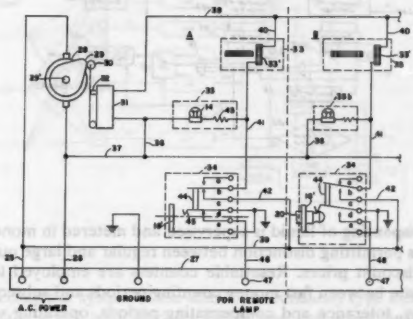
3,665,165

TIME ACCUMULATOR FOR ACCUMULATING WORKERS' TIME ON THE JOB

Charles F. Strandberg, Jr.; Robert C. Strandberg, and Jerry M. Kennon, all of Greensboro, N.C., assignors to Strandberg Engineering Laboratories, Inc., Greensboro, N.C.

Filed Aug. 3, 1970, Ser. No. 60,506
Int. Cl. G07c 3/10
U.S. Cl. 235—92 T **12 Claims**

An apparatus for accumulating the time spent by individual workers on a job comprising a source of periodic electric timing pulses and worker assigned time accumulator units connected in circuit with the source of periodic timing pulses. Each of the time accumulator units includes an electrical counter for counting the periodic timing pulses and a normally closed switch requiring a separable actuator to open the switch. A worker when not on a job will insert a worker assigned separable actuating device in the normally closed switch to open the switch and stop the counter from counting the periodic timing pulses. When the worker goes on a job, the separable actuator is removed from the normally closed switch to permit the switch to close and the counter to resume counting the periodic timing pulses while the worker is on the job. Plural time accumulator units may be connected in parallel circuits to receive the electric pulses from the source of periodic electric timing pulses in accordance with the requirements for workers on a job, there being one time accumulator unit for each worker on the job within the capabilities of the apparatus. The apparatus includes a box-like housing having a display panel, the front face of which has a plurality of similar display areas, each display area having a workers's identification, an indicator for the worker's accumulated time on a job and an aperture through which the worker inserts a separable actuator to open the normally closed switch located behind the display panel of the particular worker's time accumulator unit.

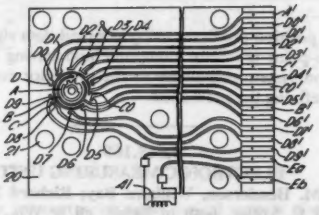


3,665,166

ELECTRICAL COUNTER

Takashi Miyagawa, Osaka-fu; Shunsuke Matsuo, and Masanori Matsumoto, both of Kyoto-fu, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto-fu, Japan

Claims priority, application Japan, June 27, 1969, 44/51456
Int. Cl. G06m 1/27
U.S. Cl. 235—92 EA **10 Claims**

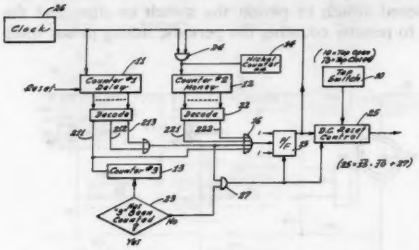


An electrical counter in which two movable contacts are provided in one rotatable wheel, six types of fixed contacts are provided on the respective orbits of circular movement of said movable contacts, and both magnet means and push-button means are provided for selectivity operating said rotatable wheel in accordance with a manual or electrical procedure.

3,665,167
APPARATUS FOR MONITORING DISPENSION OF LIQUID

Arthur J. Goodwin, Sepulveda, Calif., assignor to Diversified Inventory Systems, Inc., Honolulu, Hawaii

Filed Dec. 2, 1970, Ser. No. 94,491
Int. Cl. G01f 1/04
U.S. Cl. 235—92 FL **5 Claims**

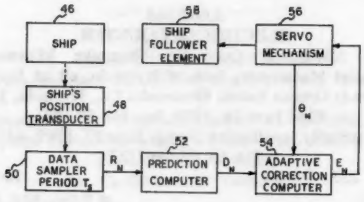


Dispensing of liquid is supervised and metered in monetary units permitting distinction between regular and large quantity discount prices. Resettable counters are employed to alternate between fast money counting periods and subsequent delay, tolerance and compensating periods, operating selectively on a cyclic basis in dependence upon continued or discontinued dispensing during delay periods. The counters determine particular periods during which a tally counter is operated.

3,665,168
ADAPTIVELY CONTROLLED POSITION PREDICTION SYSTEM

Eugene Beach Canfield, Vestal, N.Y., assignor to General Electric Company

Filed Dec. 18, 1970, Ser. No. 99,600
Int. Cl. G06f 15/50
U.S. Cl. 235—150.2 **7 Claims**



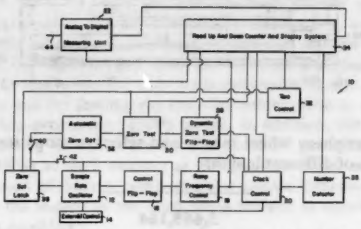
Ship's position predictor using sampled-data signal as input to a two-point predictor computer and having an adaptive correction system responsive to the predictor computer output for refining the prediction.

3,665,169
ELECTRONIC MEASURING UNIT

Robert M. Henderson, Williams Bay; Richard Zechlin, and Lowell E. Miller, both of Beloit, all of Wis., assignors to Fairbanks Morse Inc., New York, N.Y.

Filed Oct. 17, 1969, Ser. No. 867,140
Int. Cl. G06f 7/46
U.S. Cl. 235—151.3 **64 Claims**

The electronic measuring unit is a logic controlled system which is programmed by a clock control unit. A unit for producing a digital output indicative of a function to be measured is connected to feed a read up and down counter and indicator unit. This counter and indicator unit has the capability to provide an indication of the difference between a previous measurement and one or more subsequent measurements, the value of a single measurement, the difference between a measurement and a preset value, or the value of

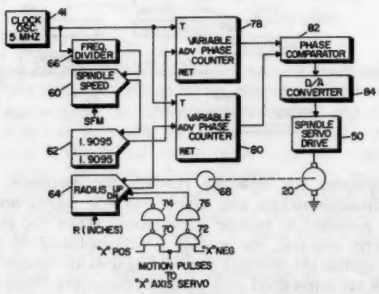


only a portion of a total value applied to a measuring sensor for the measuring unit. Additionally, the electronic measuring unit is adapted to automatically round off value indications and to zero itself when drift within predetermined limits occurs.

3,665,170
NUMERICAL CONTROL SYSTEM FOR PROVIDING A CONSTANT RATE OF METAL REMOVAL

Joseph F. Bakel, Lyndhurst, and George L. Rogers, Waynesboro, both of Va., assignors to General Electric Company

Filed Dec. 12, 1969, Ser. No. 884,417
Int. Cl. G05b 19/18; B23q 5/22
U.S. Cl. 235—151.11 **47 Claims**



A numerical control system for providing a constant rate of metal removal in terms of surface feet per unit time. The operative relationship between the rotational speed of a rotating workpiece (RPM), the effective radius in inches of the rotating workpiece (R) and the desired rate of metal removal in surface feet per minute (SFM) is defined as:

$$\int^{T} RPM \times R = \int^{T} SFM \times \int^{T} 1.9095$$

The relationship is mechanized by a plurality of digital integrators which generate pulse frequency signals proportional to each side of this relationship. These pulse frequencies are then compared with the result of this comparison affecting the speed of the rotating workpiece so as to close the control loop and fully mechanize this relationship. In one embodiment, the pulse frequencies are compared by generating phase varying signals which are then phase compared. In

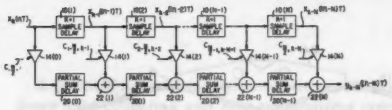
another, a single phase varying signal is generated and phase compared with a constant phase signal. A number of alternative embodiments are disclosed for indicating the speed of the rotating workpiece including a novel digitizer which also provides a steady state signal indicative of workpiece rotational speed.

3,665,171

NONRECURSIVE DIGITAL FILTER APPARATUS EMPLOYING DELAYED-ADD CONFIGURATION

John Phillip Morrow, Chatham, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 14, 1970, Ser. No. 97,594
Int. Cl. G06f 7/38, 15/34
U.S. Cl. 235—152 8 Claims



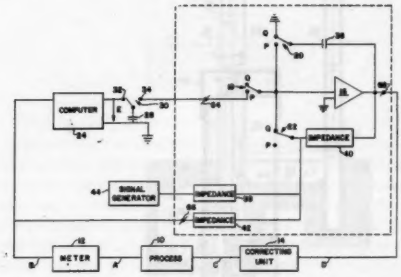
By selectively altering the delay introduced by each of the delay units of a nonrecursive digital filter and by employing an alternating series of two-input adders and partial sum delay units to perform the required addition of weight signal samples, the components of nonrecursive digital filters can be considerably simplified. In particular, the large adder required in prior art filters is eliminated.

3,665,172

CONTROL OF A PROCESS VARIABLE BY A COMPUTER AND A CONTROLLER WHICH REPLACES THE COMPUTER

Klaas Spaargaren, and Aart Bijl, both of Amsterdam, Netherlands, assignors to Shell Oil Company, New York, N.Y.

Filed June 25, 1969, Ser. No. 836,463
Int. Cl. G05b 7/00
U.S. Cl. 235—150.1 9 Claims



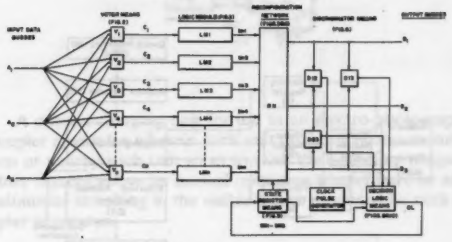
A method and apparatus for controlling a process variable wherein the variable is controlled primarily by a digital computer but where a part of the control function is performed by an analog controller. When the control is by the computer, an output signal is passed intermittently from the computer to a memory amplifier, the output signal of which is a control signal that may be used for correcting the process variable. When control is by the controller, the memory amplifier operates as a summing amplifier for negative feedback control.

3,665,173

TRIPLE MODULAR REDUNDANCY/SPARING

Willard G. Bouricius, Katonah, N.Y.; William C. Carter, Ridgefield, Conn.; John P. Roth, Ossining, and Peter R. Schneider, Peekskill, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 3, 1968, Ser. No. 756,753
Int. Cl. G06f 11/04
U.S. Cl. 235—153 11 Claims



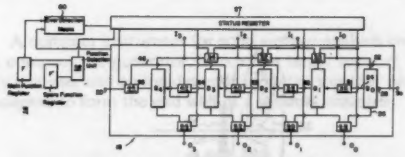
A computer system of the standby redundancy type including three active logic modules and at least one spare module, characterized by the provision of triple modular redundancy means for correcting and locating the failure of a first one of said active logic modules, in combination with sparing means for reconfiguring the system to by-pass the faulty module and to substitute the spare module therefor. The invention is further characterized by the provision of means for reintroducing the first module into the system upon the detection of failure of another active module.

3,665,174

ERROR TOLERANT ARITHMETIC LOGIC UNIT

Willard G. Bouricius, Katonah, N.Y.; William C. Carter, Ridgefield, Conn.; Keith A. Duke, Wappingers Falls, N.Y.; John P. Roth, Ossining, N.Y., and Peter R. Schneider, Peekskill, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 3, 1968, Ser. No. 756,817
Int. Cl. G06f 11/04
U.S. Cl. 235—153 8 Claims

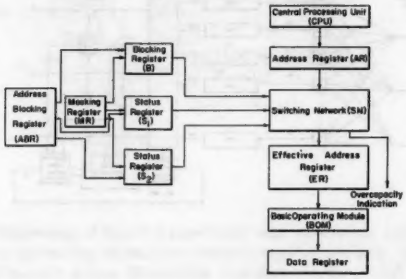


The error tolerant arithmetic logical unit is divided into vertical bit-planes which are relatively independent, being coupled mainly for the purposes of shifts and carry propagation. The system tolerates failures and still functions correctly by reconfiguring the unit through the control of interplane connections. By inserting a spare bit-plane into the system and switching between bit-planes to bypass a failed plane, the effect of the failed plane or of a failure in a position of control logic can be eliminated.

3,665,175
DYNAMIC STORAGE ADDRESS BLOCKING TO ACHIEVE ERROR TOLERATION IN THE ADDRESSING CIRCUITRY

Willard G. Bouricius, Katonah, N.Y.; William C. Carter, Ridgefield, Conn.; John P. Roth, Ossining, and Peter R. Schneider, Peekskill, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 3, 1968, Ser. No. 757,002
Int. Cl. G11c *29/00*
U.S. Cl. 235—153 **27 Claims**

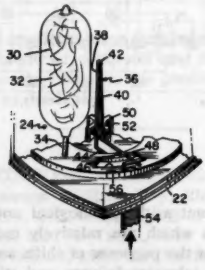


Mapping control means for achieving error toleration in computer addressing circuitry including switching means for connecting an address register with the effective address register of a basic operating module. The switching means are operable by a blocking register and at least one status register to control the mapping connections in a given manner. The invention is characterized by the provision of an address blocking register and a mask register that process a sequence of failed addresses and insert corresponding control instructions in the blocking and status registers so that the switching means dynamically excludes access to the memory area affected by the faulty address circuitry.

3,665,176
PHOTOGRAPHIC FLASHLAMP UNIT

John W. Shaffer, Williamsport, and Thomas B. McDonough, Allenwood, both of Pa., assignors to GTE Sylvania Incorporated

Filed Feb. 18, 1971, Ser. No. 116,514
Int. Cl. G03b *15/04*
U.S. Cl. 240—1.3 **5 Claims**

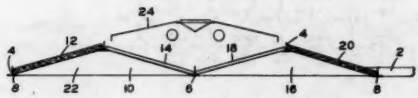


A multilamp photographic flashlamp unit, the lamps of which are of the percussive primer type, having self-contained firing elements each in the form of a self-latching folded torsional spring. The spring is shaped as a hairpin having two segments joined at the top by a bight with a supporting foot projecting from the lower end of one of the segments and a striker projecting from the bottom of the other segment for firing an associated lamp. One of the segments has a deformation just above the striker which tends to engage the other segment for stabilizing both the cocked position and arc of travel of the striker.

3,665,177
SHALLOW PROFILE VAULTED LIGHTING MODULE

Milton G. Brown; James C. Ollinger, and Joseph E. Sienkiewicz, all of Lancaster, Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Filed Dec. 28, 1970, Ser. No. 101,486
Int. Cl. F21s
U.S. Cl. 240—9 R **3 Claims**

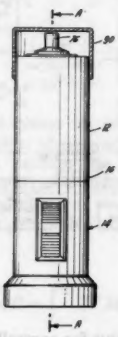


A shallow profile vaulted lighting module is formed by making a dual module structure in the same space which would normally be occupied by a single module or by using half the area of a normal module to form a small module structure. The small module structures are then provided with lenses so that one or both sides of the vaulted section can function as the luminaire lens for a light.

3,665,178
RESERVE TYPE FLASHLIGHT

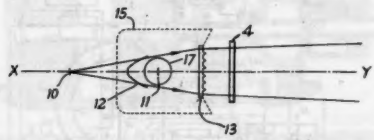
George J. Sussingham, Yonkers, and Franklin G. Fagan, Jr., Ossining, both of N.Y., assignors to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Filed July 9, 1970, Ser. No. 53,522
Int. Cl. F21l *15/00*
U.S. Cl. 240—10.6 **9 Claims**



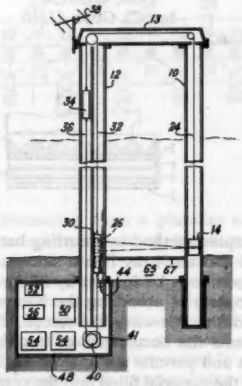
A reserve flashlight utilizing a reserve cell, normally inactive by keeping the electrolyte isolated, until desired for use, and then rendered active by releasing the electrolyte to function between the electrodes. The housing is a plastic molded structure, inexpensive enough to be discarded when the cell is used up.

3,665,179
LIGHTING SYSTEM
William James McLintic, London, England, assignor to British Lighting Industries Limited, London, England
Filed Jan. 24, 1969, Ser. No. 793,800
Claims priority, application Great Britain, May 28, 1968, 25,493/68
Int. Cl. F21v 13/04
U.S. Cl. 240—41.3 10 Claims



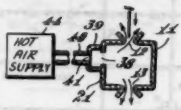
A lighting system has a generally hyperboloidal mirror having a light-reflecting and heat-transmitting coating to form a virtual image of a light source and a lens to project a beam of light of depleted heat content, the virtual image acting as the source of the light projected by the lens.

3,665,180
METHOD AND APPARATUS FOR MEASURING THE WATER CONTENT OF A SNOWPACK
Pierre Guillot, and Michel Vuillot, both of Grenoble, France, assignors to Electricite De France (Service National), Paris, France
Filed Nov. 25, 1969, Ser. No. 879,652
Claims priority, application France, Dec. 20, 1968, 179,725
Int. Cl. G01t 1/17; G01n 23/08
U.S. Cl. 250—43.5 D 11 Claims



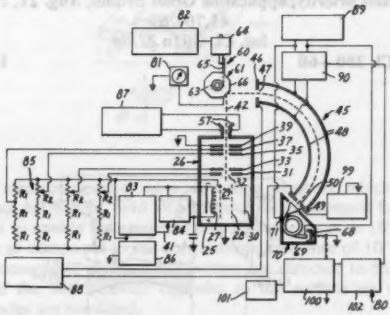
A device for measuring the water content of a snowpack comprises two vertical tubes respectively locating a standard gamma ray source delivering a horizontal beam and a detector. The source and the detector are moved simultaneously in the respective tubes by a step-by-step motor. Each step occurs after a pre-determined number of pulses has been delivered by the detector so that the time interval between two successive movements is proportional to the water content of the snow layer between two successive movements of the source and detector.

3,665,181
HEATED CORONA CHARGING UNIT
Harold W. Cobb, Acton, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.
Filed Jan. 14, 1970, Ser. No. 2,878
Int. Cl. G03g 15/02
U.S. Cl. 250—49.5 ZC 2 Claims



A corona charging unit for use in an electro-photographic copier apparatus wherein such unit utilizes a heater mounted on or nearby such unit so as to raise the operating temperature thereof above its normal operating temperature so as to eliminate streaking in the visible image produced by such copier apparatus.

3,665,182
ELEMENTAL ANALYZING APPARATUS
Robert F. Goff, White Bear Lake, Minn., and David P. Smith, North Hudson, Wis., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Aug. 18, 1969, Ser. No. 850,810
Int. Cl. H01j 37/26
U.S. Cl. 250—49.5 PI 15 Claims

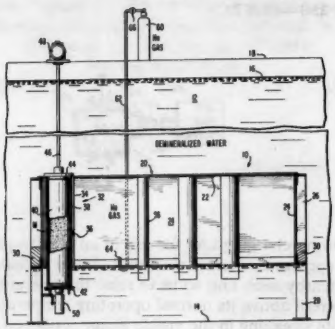


A compact instrument for solid surface analysis comprising a compact ion generator, a movable target support, an energy analyzer and an ion detector mounted together on a flange adapted to form the end wall of a vacuum chamber.

3,665,183
POOL IRRADIATOR WITH RADIATION SOURCE IN A ROTATING CONTAINER
Jackson A. Ransohoff, Bethesda, Md., assignor to Neutron Products Inc., Dickerson, Md.
Filed May 28, 1969, Ser. No. 828,519
Int. Cl. H01j 37/20
U.S. Cl. 250—52 6 Claims

An irradiator operable with a radiation source under the surface of a pool of water includes a gas filled space within the irradiator and between the irradiation source and various positions in which containers of material are irradiated. The various positions are at preselected distances from the source to allow simultaneous experiments and the gas filled space

conserves radiation. The radiation source may be a plurality of rods within tubes arranged circumferentially to one of the



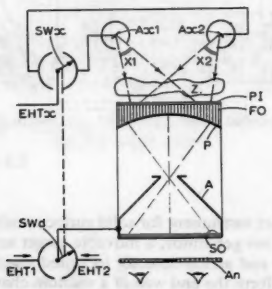
containers of material to be irradiated and the containers of material to be irradiated may be rotated during irradiation.

3,665,184

MULTI-COLORED STEREOSCOPIC X-RAY IMAGING AND DISPLAY SYSTEMS

Pieter Schagen, Redhill, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 11, 1970, Ser. No. 62,853
Claims priority, application Great Britain, Aug. 21, 1969, 41,704/69
Int. Cl. G01n *23/04*
U.S. Cl. 250—60 **1 Claim**



X-ray imaging and display apparatus comprise means for switching an X-ray source sequentially between two or more voltage levels so as to generate X-rays of different energies and a switchable multi-color filter or image converter with means for switching the color of the filter or converter automatically in accordance with changes in X-ray energy.

The system may employ a switchable multi-color filter or an image converter tube having a multi-color screen of the "-penetron" type.

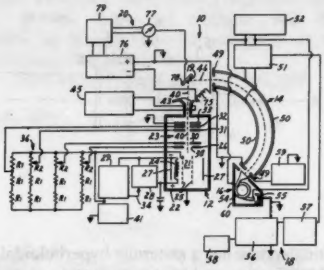
If a switchable polarization system is added, the apparatus can provide steroscopic pictures in color.

3,665,185

ION SCATTERING SPECTROMETER WITH NEUTRALIZATION

Robert F. Goff, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Oct. 19, 1970, Ser. No. 81,952
Int. Cl. H01j *37/00*
U.S. Cl. 250—49.5 P **5 Claims**



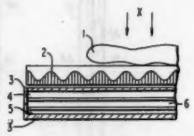
Ion scattering spectrometer for elemental analysis comprising an ion generator, an energy analyzer, an ion detector, an indicating apparatus and a closed-loop feed-back device for neutralizing an electrically non-conductive target.

3,665,186

HALF TONE RADIOGRAPHY METHOD AND APPARATUS

Mataichi Tajima, Kanagawa, Japan, assignor to Fuji Photo Film Co. Ltd., Nakanuma, Minami-Ashigara Machi Ashigara-Kamigura, Kanagawa, Japan

Continuation-in-part of application Ser. No. 513,958, Dec. 15, 1965, and 627,359, Mar. 31, 1967. This application Dec. 4, 1969, Ser. No. 882,246. The portion of the term of the patent subsequent to Apr. 28, 1987, has been disclaimed. Claims priority, application Japan, Dec. 15, 1964, 39/70319; Mar. 31, 1966, 41/20130
Int. Cl. G03b *41/16*
U.S. Cl. 250—62 **23 Claims**



A radiographic method by inserting between an object to be recorded and an X-ray film a sine-wave-like net-screen. The net pattern may be formed by filling a metallic powder having a property of absorbing the X-rays into the concave net pattern of the sine-wave-like screen. The presence of the screen prevents the occurrence of troubles caused by scattered X-rays and permits the tone of the image to be varied by selecting the material filled into the concave net pattern.

3,665,187

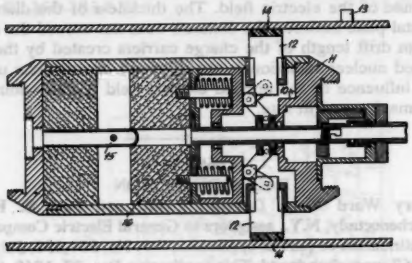
EQUIPMENT FOR RADIOGRAPHY OF PIPELINES AND CLOSED VESSELS

Stephen Stein, London, England, assignor to National Research Development Corporation, London, England

Filed Dec. 24, 1968, Ser. No. 786,576
Claims priority, application Great Britain, Dec. 27, 1967, 58,629/67
Int. Cl. G03b *41/16*
U.S. Cl. 250—83.3 D **7 Claims**

A pipeline crawler in the form of a self-propelled vehicle is controlled by a radiation detector carried on the vehicle. The

vehicle carries a powerful radiation source and a movable shield for the source which is normally in the closed position. On energization of the detector from a weak radiation source placed outside the pipe the vehicle is stopped by the activa-



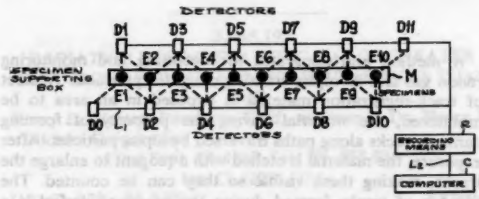
tion of its brakes and the radiation shield opens to expose the source. A timing mechanism operates to close the shield, release the brakes and restart the vehicle after a predetermined time.

3,665,188

METHOD AND APPARATUS FOR TESTING THE INDIVIDUAL EMISSIVE PROPERTIES OF A PLURALITY OF RADIOACTIVE SPECIMENS

Johannes Gutmann, Geneva, Switzerland, assignor to Sen Electronique

Filed Aug. 1, 1969, Ser. No. 846,878
Claims priority, application Switzerland, Aug. 16, 1968, 1238/68
Int. Cl. G01t 1/20
U.S. Cl. 250—83.3 R **9 Claims**



The radiation emanating from a plurality of radioactive specimens is examined by means of detectors arranged to each receive radiation emitted from two or three specimens, simultaneously, each specimen emitting radiation to a group of two or three detectors respectively. Coincidences of detection are ascertained by double and/or triple AND gates connected to the outputs of each group of detectors and heights of pulses emitted by the detectors are added by a transformer matrix, each transformer of the matrix being connected to the output of a group of the detectors. The sums are then recorded and the results analyzed by a digital computer.

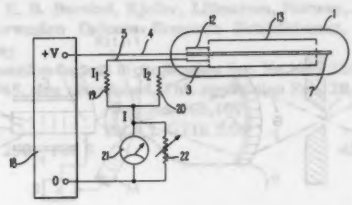
3,665,189

RADIATION COUNTING TUBE OF THE GEIGER-MULLER TYPE

Jean-Paul Maillot, Meudon, France, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Jan. 22, 1970, Ser. No. 4,968
Int. Cl. G01t 1/18
U.S. Cl. 250—83.6 R **10 Claims**

A radiation counting tube includes a plurality of longitudinally disposed cathode sections of different sensitivities coaxially surrounding a common anode to permit simplified



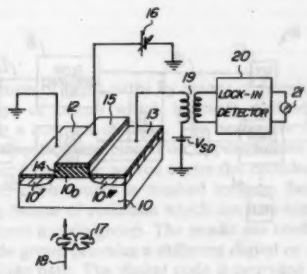
measurement of a wide range of radiation on a single meter scale without switching.

3,665,190

MOS-FET INFRARED DETECTOR

Nobuo Kotera, Kokubunji, and Yoshifumi Katayama, Hachioji, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sept. 11, 1970, Ser. No. 71,479
Claims priority, application Japan, Sept. 16, 1969, 44/72743
Int. Cl. G01t 1/24
U.S. Cl. 250—83.3 H **7 Claims**



An electromagnetic wave detecting element which employs an MOS type field effect device as an element for detection to enable the response time to be as short as 10^{-7} sec or less as compared to the conventional response of 10^{-3} sec. Electromagnetic waves for detection are directed to the surface of the MOS device opposite to the surface on which electrodes are provided.

3,665,191

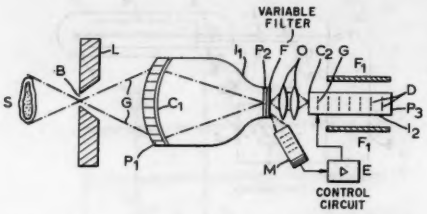
FILTER FOR COMPENSATING EFFICIENCY DIFFERENCES IN AN OPTICAL SYSTEM

Norman Frank Moody, Toronto, Ontario, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Ontario, Canada

Filed Nov. 28, 1969, Ser. No. 880,730
Claims priority, application Great Britain, Dec. 16, 1968, 59,686/68
Int. Cl. G21h 3/00
U.S. Cl. 250—86 **7 Claims**

A compensating filter for use in a registered position at an optical plane in an optical system having differences in efficiencies such that energy from a uniform source creates light of varying intensities over the area of the optical plane, the filter comprising a film negative produced by exposing the film while in registered position at the optical plane to a uniform source through the preceding elements of the system and then developing the film so that its density variations match the variations in light intensities arriving at the optical plane over the area thereof, the negative having its greatest

density where the light intensity was greatest and vice versa whereby energy from a uniform source after being translated



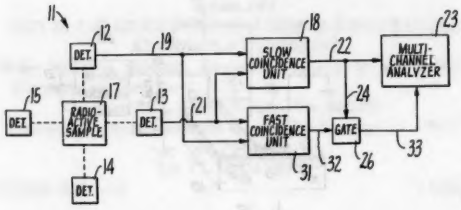
through the system and film negative emerges as substantially uniform light.

3,665,192

LABELING OF MOLECULES USING THE PERTURBED ANGULAR CORRELATION OF GAMMA RADIATION

John D. Baldeschwieler, 221 Durazno Way, Menlo Park, Calif.

Filed Nov. 28, 1969, Ser. No. 880,778
Int. Cl. G01t 1/20
U.S. Cl. 250—71.5 R **14 Claims**



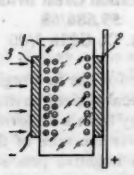
A method of studying molecular motion and orientation by labeling a molecule with a radio active tracer having a half life of an excited state generally comparable to the nuclear relaxation time in this state and measuring the rotational correlation time of a molecule from the perturbed angular correlation.

3,665,193

DIAMOND NUCLEAR RADIATION DETECTOR

Stanislav Fedorovich Kozlov, and Elena Alexandrovna Konorova, both of Moscow, U.S.S.R., assignors to Ordena Lenina Fizichesky Institut Imeni P. N. Lebedeva Leninsky Prospekt, Moscow, U.S.S.R.

Filed Mar. 28, 1968, Ser. No. 716,953
Claims priority, application U.S.S.R., Mar. 29, 1967, 1,144,951
Int. Cl. G01t 1/202
U.S. Cl. 250—83 R **14 Claims**



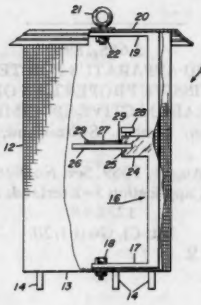
A diamond nuclear radiation detector comprising a diamond crystal plate and contacts on the opposite sides of said plate adapted for the application of an electric field to said diamond crystal plate. The contact on the side of the crystal plate to be irradiated in the course of detecting nuclear radiation is constituted as a blocking contact in relation to charge carriers, whereas the opposite contact is constituted of a meterial capable, in conjunction with the diamond plate, of injecting the charge carriers under the influence of the electric field. The thickness of the diamond crystal plate between the contacts does not exceed the maximum drift length of the charge carriers created by the detected nuclear radiation in the diamond crystal plate under the influence of the applied electric field corresponding to the maximum drift rate.

3,665,194

RADON DETECTION

Henry Ward Alter, Danville, Calif., and Paul B. Price, Schenectady, N.Y., assignors to General Electric Company

Continuation-in-part of application Ser. No. 654,631, July 19, 1967, now abandoned. This application Dec. 27, 1968, Ser. No. 787,431
Int. Cl. G01t 1/04
U.S. Cl. 250—83 CD **21 Claims**



A method and apparatus for detecting and monitoring radon gas and its alpha-emitting daughter products. A sheet of track-registration material is exposed in an area to be monitored, the material having the property of forming damage tracks along paths traversed by alpha particles. After exposure, the material is etched with a reagent to enlarge the tracks, making them visible so they can be counted. The number of tracks formed during the exposure period is a measure of the amount of radon and radon daughters present in the monitored area. The invention is useful as a dosimeter to monitor mine atmospheres, and also has applications in uranium prospecting.

3,665,195

THERMAL NEUTRON ACTIVATION RADIOACTIVITY LOGGING METHOD

Arthur H. Youmans, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

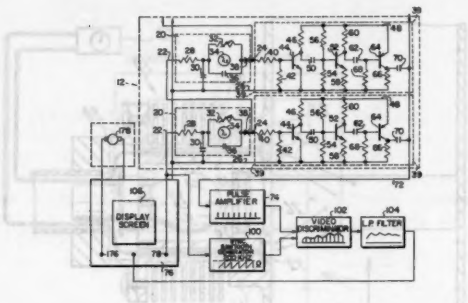
Filed Oct. 16, 1969, Ser. No. 867,018
Int. Cl. G01v 5/00
U.S. Cl. 250—83.3 R **14 Claims**

A method of determining the existence and quantity of an element in a formation. A portion of the formation is irradiated with neutrons and the gamma rays emanating from the formation due to induced radio-activity, or "activation" from thermal neutron capture by the element of interest are detected and recorded. The thermal neutron capture cross section of the formation is determined. The product of the gamma ray emission and the thermal neutron capture cross section is obtained as a quantitative indication of the element's abundance in the formation.

3,665,196
SOLID STATE SCANNING SYSTEM

Thomas F. Macall, Sunnyvale, Calif., assignor to Midland Capital Corporation, New York, N.Y.

Filed Feb. 22, 1971, Ser. No. 117,454
Int. Cl. G01t 1/16
U.S. Cl. 250—83.3 H 11 Claims

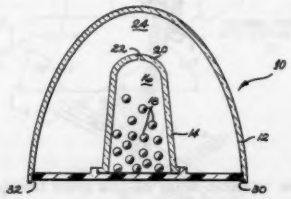


A solid state infrared scanning system for generating a train of pulse-position modulated pulses with the position of each pulse representative of the radiation incident upon a corresponding detector cell in a linear detector array. Conversion of the pulse-position modulated signal to a corresponding amplitude modulated signal allows visual display of the amplitude modulated signal to produce an image of the incident radiation. The array of detector cells can also be rotated to provide a solid angle field of view.

3,665,197
RADIATION DOSIMETER USING GAS OF GREATER ELECTRON AFFINITY AND MOLECULAR MOSS THAN AIR

Henry L. Richter, Pasadena, Calif., assignor to Dr. Henry L. Richter Corporation

Filed Sept. 15, 1969, Ser. No. 858,031
Int. Cl. G01t 1/14
U.S. Cl. 250—83.3 PD 7 Claims

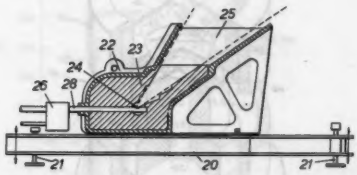


In a radiation dosimeter, wherein a sealed container encloses an ionizable gas and dielectric members for separating a triboelectric charge, the improvement wherein the ionizable gas comprises a material having a greater mass and greater electron affinity than air. Specific materials include sulfur hexafluoride and fluorinated hydrocarbons.

3,665,198
AIRCRAFT LANDING GUIDANCE SYSTEM USING COLLIMATED FAN SHAPED RADIATION BEAMS

Gotfred E. B. Barstad, Kjeller, Lillestrom, Norway, assignor to Norwegian Defence Research Establishment, Kjeller, Norway

Continuation-in-part of application Ser. No. 449,220, Apr. 19, 1965, now abandoned. This application Feb. 28, 1969, Ser. No. 805,109
Int. Cl. G21h 5/00
U.S. Cl. 250—106 S 45 Claims



The identification of flight paths by means of forming plural coded groups of beams which intersect desired flight paths and define a corridor of flight. The beams are formed by pairs of radiation sources placed on opposite sides of the flight corridor, or by a single source under the corridor or to the side thereof. Each source is masked to form flat collimated diverging beams of radiation which are non-intersecting and which form a code group. The masks are configured so that each code group provides a different digital or analog code for each flight path. The digital code is provided by the presence or absence of beams at periodic distances along any flight path intersecting a different grouping or digital code of the code group. The analog code is provided by angularly positioning certain of the beams in a code group and having others the intersection of which is planes along the flight direction are parallel. With the distances between parallel beams as a reference, the distance along any flight path between a parallel beam and the angularly positioned beam is unique for each flight path within the flight corridor. By generating identical code groups positioned all along the corridor, an entire flight path to touchdown can be defined.

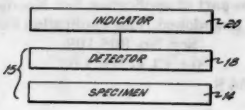
3,665,199
BETA-RAY THICKNESS GAUGE USING A TWO ENERGY LEVEL BETA-RAY SOURCE

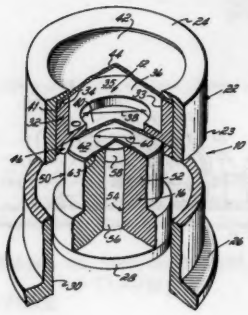
Bonaventure B. Cahill, Ft. Mitchell, Ky., and Wilfred W. Lyon, Cincinnati, Ohio, assignors to The Ohmart Corporation, Cincinnati, Ohio

Filed Nov. 10, 1969, Ser. No. 875,200
Int. Cl. G21h 5/00
U.S. Cl. 250—106 S 10 Claims

A beta gauge for measuring the thickness of material over an extended range, for example, 0 – 750 mg/cm², including a first cell containing gaseous low energy beta-emitting radioactive Krypton-85 and having a first window adjacent an air gap in which the specimen to be measured is located and a second window opposite thereto, and a second cell containing high energy beta-emitting radioactive Strontium-90/Yttrium-90 located adjacent the Krypton cell on the side thereof opposite the air gap and having a third window aligned with the first and second windows of the Krypton cell

through which beta radiation from the Strontium-90/Yttrium-90 passes along a path to the specimen which includes





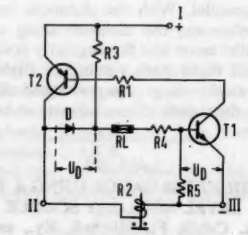
also the first and second windows of the Krypton cell as well as the Krypton itself.

3,665,200

OPTO-ELECTRONIC TIMING SWITCH

Richard Zaubitzer, Frankfurt am Main, Germany, assignor to Siemens Aktiengesellschaft, Berlin, Germany

Filed Nov. 18, 1970, Ser. No. 90,637
Claims priority, application Germany, Nov. 26, 1969, P 19 59 357.8
Int. Cl. G02f 1/28; H01j 39/12
U.S. Cl. 250—217 R **18 Claims**



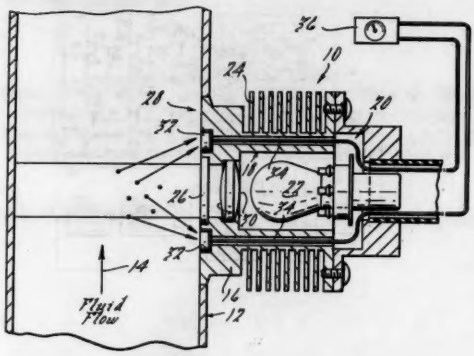
An optoelectronic timing switch comprises a monostable bistate amplifier which furnishes an electric output signal when in one of its two states. The amplifier has an input which, as long as it receives an electric signal above a threshold intensity, maintains the switch in non-stable state. A radiation pulse source illuminates a phosphorescent layer to whose brightness a radiation detector is responsive, this detector being electrically connected with the amplifier input. The phosphorescent layer has an effective afterglow persistence of longer duration than the pulse duration of the source in order to maintain the amplifier input signal above the threshold intensity for a prolonged timing period.

3,665,201

TURBIDIMETER UTILIZING BACK SCATTER

James J. Shea, Dearborn Heights, and Samuel S. Ochodnicky, Detroit, both of Mich., assignors to Gam Rad, Inc., Detroit, Mich.

Continuation-in-part of application Ser. No. 786,198, Dec. 23, 1968, now abandoned. This application Apr. 16, 1970, Ser. No. 28,996
Int. Cl. G01n 21/26
U.S. Cl. 250—218 **4 Claims**



A turbidimeter having a probe mounted in a single opening in a fluid flow line which has a smooth uniform face in contact with the flowing fluid, a collimated incident light source and a photosensitive cell positioned to receive back scatter light

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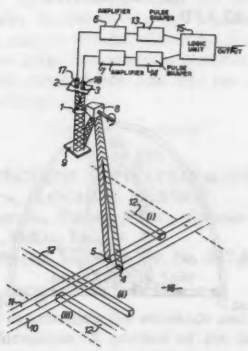
3,665,202

APPARATUS FOR DETECTING OBJECTS

Alexander D. McLeman, Corby, England, assignor to British Steel Corporation, London, England

Filed May 25, 1970, Ser. No. 40,195
Claims priority, application Great Britain, June 2, 1969, 27,900/69
Int. Cl. H01j 3/14
U.S. Cl. 250—237 R **3 Claims**

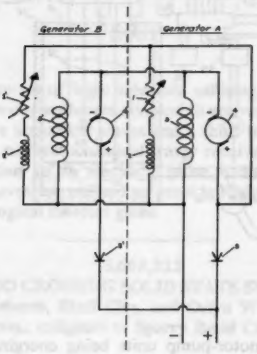


In apparatus for detecting an object by scanning two parallel paths having means for producing signals from radiation sensed by the scanning, an improvement comprises means for inhibiting the signal producing means at the limits of the scans. The inhibiting means comprise a shutter mounted for movement in synchronism with the scanning.

3,665,203
PARALLEL DIRECT CURRENT GENERATORS ARRANGEMENT

Elben Ray Barnett, and Raymond Ray Barnett, both of Charleston, W. Va., assignors to Jerry D. Hogg, Charleston; Secondo Dalporto, Charleston Hts., W. Va. and Tony Gentile, Wintersville, Ohio, part interest to each

Filed Mar. 15, 1971, Ser. No. 124,198
Int. Cl. H02j 1/10
U.S. Cl. 307—84 7 Claims

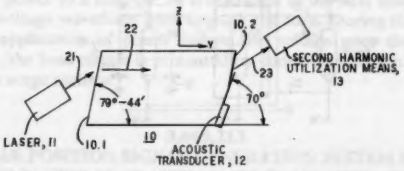


A circuit arrangement for arranging a number of direct current generators, including generators having different characteristics in parallel. One generator is used as a master to excite the shunt fields of all of the generators and rectifiers are arranged in the output terminals of the parallel generator arrangement for preventing current from the armature of each generator from passing through the armature of any other generator.

3,665,204
ACOUSTO-OPTIC TUNING OF OPTICAL SECOND HARMONIC GENERATORS AND OTHER PARAMETRIC DEVICES

Donald Frederick Nelson, Summit, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Nov. 16, 1970, Ser. No. 89,622
Int. Cl. H03f 7/00
U.S. Cl. 307—88.3 10 Claims

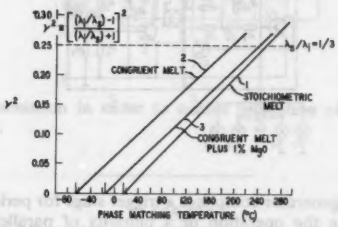


An input optical wave and an input acoustic wave are incident upon an optically nonlinear crystal to form a phase-matched intermediate acousto-optical wave propagating in the crystal. By appropriately orienting the crystal axes relative to the propagation and polarization directions of the various waves propagating therein, an output second harmonic optical wave can be generated which is also phase-matched, and which can be modulated in intensity according to the input acoustic wave intensity or frequency. This phase-matching of both the intermediate and the output waves increases the overall efficiency of modulation.

3,665,205
MODIFIED LITHIUM NIOBATE COMPOSITION AND DEVICES UTILIZING SAME

Paul Michael Bridenbaugh, Piscataway; John Robert Carruthers, Murray Hill, and Franklin Richard Nash, Griggstown, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Feb. 16, 1971, Ser. No. 115,467
Int. Cl. H03f 7/00
U.S. Cl. 307—88.3 6 Claims

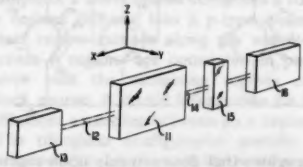


The phase-matching temperature for different frequencies of electromagnetic waves in $LiNbO_3$ is increased by the addition of MgO to the melt. Variation of this temperature in successive portions of the grown crystal is minimized. The resulting product is usefully incorporated in nonlinear optical devices such as second harmonic generators and parametric oscillators designed for operation at elevated temperatures at which radiation damage is annealed out.

3,665,206
NONLINEAR DEVICES

John George Bergman, Jr., Morganville, and James Hoffman McFee, Colts Neck, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Mar. 12, 1971, Ser. No. 123,724
Int. Cl. H03f 7/00
U.S. Cl. 307—88.3 14 Claims



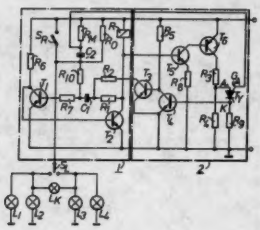
Nonlinear devices including second harmonic generators and other parametric devices are fabricated from thin films of organic polymer materials having net dipole moments. Such materials exemplified by polyvinylidene fluoride are prepared for use by mechanical working so as to produce crystallographic alignment, and by electrical poling so as to produce dipolar orientation. Continued "poling" may or may not be necessary during operation of the device. Relative indices of refraction may be altered by altering the degree of crystalline orientation so as to change birefringence. Phase matching with the traversing beam propagating in a given direction may therefore be accomplished for a variety of wavelengths.

3,665,207

PULSE GENERATOR

Paul Sieber, Lortzingstrasse 20, 71 Heilbronn-Bockinger, Germany

Filed Aug. 25, 1970, Ser. No. 66,782
Claims priority, application Germany, Sept. 3, 1969, P 19 44 691.4
Int. Cl. B60q 1/26
U.S. Cl. 307—106 13 Claims



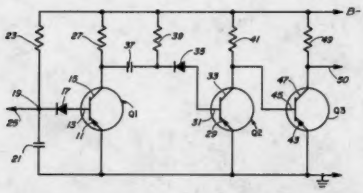
A pulse generator comprises a trigger stage for periodically interrupting the operation of a plurality of parallel loads. Connected to a voltage supply, are a capacitor and a precision resistor connected between the loads and the supply, a switching unit receiving voltage peaks which appear at the precision resistor on an interruption of operation, the switching unit being responsive to the voltage peaks and retaining its switching state caused by a voltage peak at least until it receives a voltage peak of another value and means for variation of the frequency of interruptions in response to a switching state of the switching unit caused by a voltage peak of a value indicative of a field load.

3,665,208

PULSE GENERATOR

Thomas P. Jachimek, Evergreen Park, and James A. Wrabel, Chicago, both of Ill., assignors to The Seeburg Corporation of Delaware, Chicago, Ill.

Filed Sept. 11, 1970, Ser. No. 71,585
Int. Cl. H03k 3/00
U.S. Cl. 307—106 8 Claims



A pulse generator that does not rely upon regeneration is utilized to provide a shaped output pulse in response to an input signal. Three transistors are connected in what is essentially a three stage non-inverting amplifier having appropriate interconnections to provide a pulse output having a standard duration and shape regardless of input characteristics.

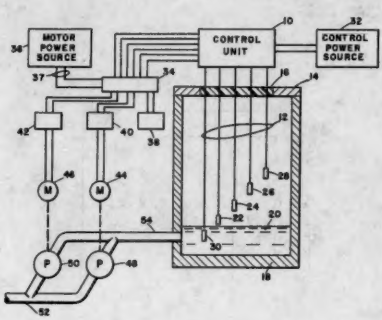
3,665,209

FLUID LEVEL CONTROL SYSTEM

Robert M. Webb, Cornell, and Keith S. Parry, Granada Hills, both of Calif., assignors to T. H. Creears Corporation

Filed Oct. 22, 1969, Ser. No. 870,519
Int. Cl. H01h 35/18
U.S. Cl. 307—118 1 Claim

A fluid level control system employing a plurality of probes for detecting various fluid levels with each probe having a probe circuit that is closed in response to changes in a capacitive coupling between the probe and the fluid, to provide output signals to a control circuit that in response thereto selectively controls the operation of one or more motor-pump units in a manner that at least one of the motor-pump units is selected in random manner for initial operation, with all motor-pump units being energized upon the continued rising level of the fluid as detected by higher level probes. All the motor-pump units continue to operate until the fluid level is lowered to a point below the level of the lowest detecting probe. The probe circuit employs a capacitive coupling fluid detection, or a capacitive coupling with a neutral return probe through the fluid or with a direct electrical connection with common connected neutral return probes.

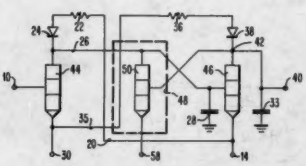


3,665,210

MONOLITHIC BIPOLAR CONVERTIBLE STATIC SHIFT REGISTER

Irving T. Ho, Poughkeepsie; Peter E. Howell, Wappingers Falls, and Teh-Sen Jen, Fishkill, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 30, 1970, Ser. No. 51,188
Int. Cl. G11c 11/24, 11/34, 19/00
U.S. Cl. 307—238 13 Claims

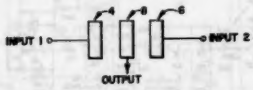


A storage cell suitable for implementation as a monolithic shift register in which a pair of monolithic parasitic capacitors are selectively charged solely in response to periodic non-dc signals to set the digital state of the storage cell. Semiconductor switching means connected between the first and second capacitors is responsive to periodic signals to regenerate the cell for operation in a static mode. Alternatively, a dc circuit prevents loss of cell information during a static mode. The semiconductor switching means is virtually eliminated from the circuit by proper biasing so as to also render the cell operable for use in a dynamic shift register mode.

3,665,211
SURFACE ACOUSTIC WAVE COMPUTER LOGIC ELEMENTS

John M. Owens, Newport Beach, and Gary F. Sallee, Yorba Linda, both of Calif., assignors to North American Rockwell Corporation

Filed Jan. 11, 1970, Ser. No. 105,206
Int. Cl. H01h 35/00
U.S. Cl. 307—117 8 Claims

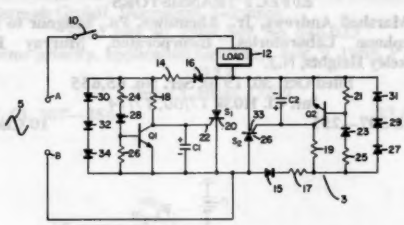


A complete set of logic elements utilizing the basic combination of two transducers adapted to convert electrical pulses to surface acoustical waves and a third transducer which converts the surface acoustical waves received from the first two transducers to an electrical pulse is disclosed. Surface acoustical waves are utilized to provide logical NAND, logical OR and logical inverter gates.

3,665,212
ZERO CROSSING SOLID STATE SWITCH

Arthur S. Roberts, Bluff City, and Orlyn W. Craig, Bristol, both of Tenn., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Nov. 24, 1970, Ser. No. 92,476
Int. Cl. H03k 17/00
U.S. Cl. 307—252 T 6 Claims



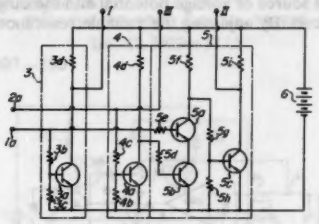
There is disclosed herein a solid state switch for use with the application of a. c. power to a load circuit to eliminate high surge currents and transients that normally occur when switching line voltage to a load. The initial application of full a. c. power to a load circuit is restricted to the next time that the voltage waveform goes through the zero. During the initial application of power before the voltage goes through zero, the load circuit is protected by control circuitry including a surge resistor.

3,665,213
GEAR POSITION SIGNAL GENERATING SYSTEM FOR ELECTRIC-TYPE AUTOMATIC TRANSMISSIONS

Takaaki Kato, Toyohashi; Mamoru Kawakubo, Kariya; Katsunori Ito, Kariya, and Hisato Wakamatsu, Kariya, all of Japan, assignors to Nippondenso Kabushiki Kaisha, Kariya-shi, Aichi-ken, Japan

Filed June 9, 1970, Ser. No. 44,757
Claims priority, application Japan, June 13, 1969, 44/47166
Int. Cl. H03k 19/22
U.S. Cl. 307—218 3 Claims

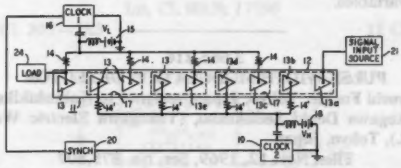
In the electric-type automatic transmission with a torque converter, which includes a hydraulic control system to control frictional coupling means of the transmission and an electric control system to control distributing valves of the hydraulic control system, a gear position signal generating system to generate signals corresponding to gear positions of the transmission in order to enable indication of the gear position.



3,665,214
SHIFT REGISTER USING INTEGRATED NEGATIVE RESISTANCE DEVICES

Robert Harold Krambeck, South Plainfield, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Nov. 17, 1970, Ser. No. 90,316
Int. Cl. H03k 17/00
U.S. Cl. 307—221 9 Claims



One example of a shift register comprises a row of triangular n-type regions diffused into a p-type wafer. An n-type back contact region extends along the wafer opposite the row. Alternate n regions are connected in parallel to one clock source with the remaining regions connected to another clock source. A stored information bit is defined by a current filament extending between an n region and a back contact. The triangular configuration permits a bit to be stepped to successive n regions in the row by appropriately synchronized clock pulses.

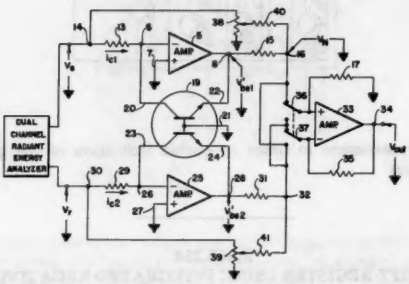
3,665,215
PURE NONLINEAR TRANSFER CIRCUIT

Attilla D. Boronkay, La Hambra, Calif., assignor to Beckman Instruments, Inc.

Filed Nov. 27, 1970, Ser. No. 93,251
Int. Cl. G06g 7/12
U.S. Cl. 307—230 13 Claims

A circuit arrangement compensates for the undesired linear component of a transfer function which contains both linear and nonlinear terms. A nonlinear circuit element having a finite constant resistance is connected between the output and input of an amplifier. An input resistor determines the current conducted from a source of voltage potential to

the input of the amplifier. A resistance output network is connected between the output of the amplifier and circuit ground and has a terminal which forms the output of the transfer circuit. A variable resistance network is connected between the source of voltage potential and the output of the transfer circuit. By adjusting the variable resistance network



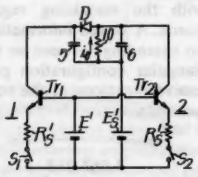
the linear term of the transfer function resulting from the finite constant resistance of the nonlinear circuit element can be eliminated to produce a pure nonlinear transfer function. Two pure nonlinear circuits are combined to form a dual channel transfer function having an output which is the difference between pure nonlinear functions of two independent variables.

3,665,216

PULSE WIDTH MODULATION DETECTOR

Tadayoshi Fuchie, Tokyo, Japan, assignor to Kabushikikaisha Yokogawa Denki Seisakusho, (Yokogawa Electric Works, Ltd.), Tokyo, Japan

Filed Nov. 12, 1969, Ser. No. 875,807
Claims priority, application Japan, Nov. 22, 1968, 43/85882; 43/85883
Int. Cl. H03k 5/20
U.S. Cl. 307—234 **2 Claims**



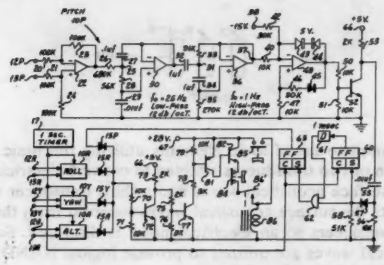
An electric signal converter having two constant-current power sources, two electric circuits respectively including said two constant-current power sources, switches incorporated in said electric circuits, a signal source for turning on and off said switches, means for producing in said electric circuits electric signals having differential factors opposite to each other, and means for coupling said two electric circuits to combine said electric signals for providing a substantially constant composite signal.

3,665,217

FLIGHT CONTROL DISABLING SYSTEM

Don L. Adams, Fairfield, Conn., and Nicholas Allen, Bedford, Mass., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Dec. 29, 1969, Ser. No. 888,585
Int. Cl. H03k 5/153; G06f 11/08
U.S. Cl. 307—235 **16 Claims**



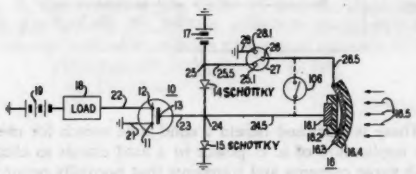
A flight control disabling system operates by measuring the amplitude and frequency of control signals in the various flight control channels of the system. If in any channel there develops an oscillatory control signal exceeding a certain amplitude and lying within a predetermined frequency band, then either that channel alone or the entire flight control system is disabled.

3,665,218

CONTROL CIRCUIT FOR INSULATED GATE FIELD EFFECT TRANSISTORS

John Marshall Andrews, Jr., Allentown, Pa., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Oct. 30, 1970, Ser. No. 85,655
Int. Cl. H03k 17/60, 17/74
U.S. Cl. 307—251 **10 Claims**



The gate voltage of an insulated gate switching transistor is controlled by means of a pair of reverse biased Schottky barrier diodes connected in mutual series aiding electrical relationship. A common node or terminal between these diodes is connected to the gate of the transistor and to an electrical switch, in order to provide means for varying the total electrical impedance across one or the other of the diodes, and thereby to turn the transistor between the "ON" and "OFF" states thereof.

3,665,219

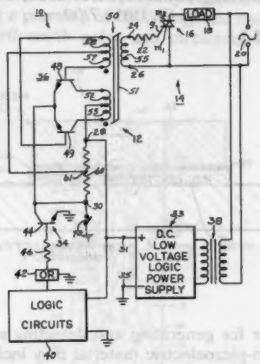
ELECTRICAL CONTROL SYSTEM

Daniel E. Teske, Tulsa, Okla., assignor to Emerson Electric Co., St. Louis, Mo.

Filed June 19, 1970, Ser. No. 47,743
Int. Cl. H03k 17/00
U.S. Cl. 307—252 B **6 Claims**

An A.C. semiconductor switch controlling the energization of a load from a relatively high voltage source is controlled by signal pulses supplied to the semiconductor from a circuit

connected to a relatively low voltage source. The control signal circuit incorporates a D.C. to A.C. converter including a rectangular hysteresis loop type transformer having feedback windings, and a pair of transistors arranged to provide a



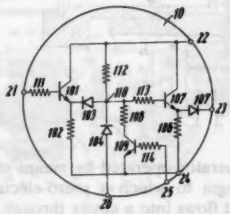
multivibrator type oscillator that produces the signal pulses for the switch in response to the application of a voltage to the converter. The converter provides control and electrical isolation between the relatively low and high voltage circuits.

3,665,220

CROSS-TRACK DISTRIBUTOR FOR VIDEO SIGNALS

Ernst Legler, Seeheim an der Bergstrasse, and Karl Kirchner, Griesheim bei Darmstadt, both of Germany, assignors to Fernseh GmbH, Darmstadt, Germany

Filed July 30, 1969, Ser. No. 846,033
Claims priority, application Germany, Aug. 9, 1968, P 17 62 722.4
Int. Cl. H03k *17/00*
U.S. Cl. 307—254 13 Claims



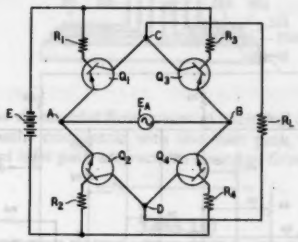
A cross-bar distributor applicable to color television signals, in which a parallel group of conductors serve as input lines to which the input television signals are applied. A second group of conductors cross over or intersect the first group of conductors and serve as output lines from which the output signals are taken. At the cross-over points of the input and output lines, electronic switching circuits are provided with semi-conductor elements and resistors in integrated circuit form. A T network of three diodes is contained within the switching circuit, and a transistor decoupling stage is connected in front of each one of the diodes lying in the longitudinal branch of the T network. The center point of the T network is connected to the tap of a voltage divider which has one branch consisting of a resistor, and the other branch in the form of a resistor connected in series with a switching transistor.

3,665,221

TRANSISTOR BRIDGE RECTIFIER CIRCUIT

Noble Ervin Wickliff, Indianapolis, Ind., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Oct. 12, 1970, Ser. No. 79,899
Int. Cl. H03m *7/12*
U.S. Cl. 307—255 2 Claims



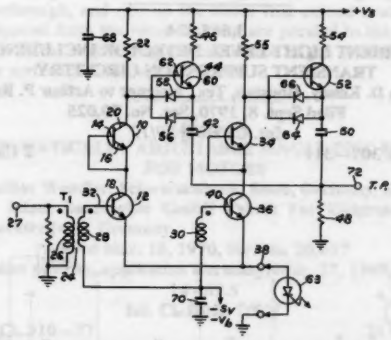
The collectors and emitters of two pairs of complementary transistors are interconnected to form a bridge circuit while their bases are connected in a forward biasing sense to a direct-current source. An alternating-current wave applied between one set of opposing corners of the bridge circuit causes a full wave rectified wave to appear between the remaining corners.

3,665,222

SHORT DURATION HIGH CURRENT PULSE GENERATOR

Robert K. Gatwood, Churubusco, Ind., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Nov. 13, 1970, Ser. No. 89,191
Int. Cl. H03k *17/00*
U.S. Cl. 307—283 11 Claims



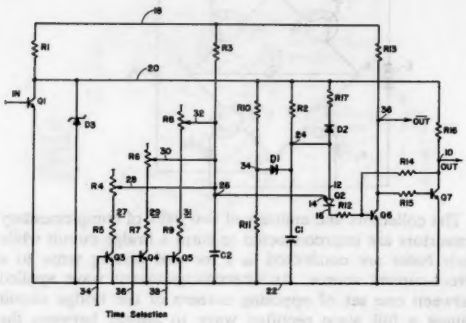
A pulse modulator includes a pair of avalanche breakdown transistors connected in series, a direct current source for maintaining the avalanche transistors in their quiescent states and a triggering means for applying a pulse to the avalanche transistors to switch them simultaneously from their quiescent states to their activated states to generate a high current short duration output pulse. The modulator further includes a charge storage circuit connected to the direct current source and diodes connected between the storage circuit and the avalanche transistors and poled such that the storage circuit charges during the quiescent states of the transistors and discharges the stored charge into the avalanche transistors for increasing the power output therefrom. A plurality of pairs of avalanche transistors, storage circuits, and diodes connected in a manner similar to that of the first pair may be provided in parallel therewith for further increasing the power output of the modulator.

3,665,223

MULTIPLE POTENTIOMETER TIMER FOR ELEVATOR CONTROLS

James H. Stichweh, Princeton, Ind.; Stephen A. Hornung, Augustine, France, and Paul Duckwall, III, Louisville, Ky., assignors to Armor Elevator Company, Inc., Milwaukee, Wis.

Filed Nov. 28, 1969, Ser. No. 880,788
Int. Cl. H03k 17/28
U.S. Cl. 307—293 11 Claims



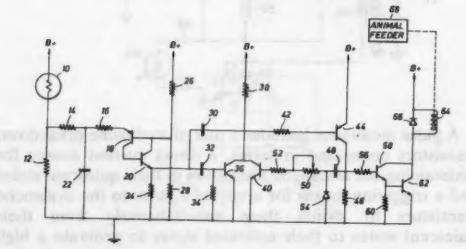
A timer circuit produces an output signal at a predetermined time following the application of an input signal. The input signal actuates a timing circuit which, at a specified time thereafter, causes a switching device to be actuated, which in turn produces the output signal. One or more of a plurality of control means are selectively insertable into the timing circuit, thereby to select one of a plurality of available time intervals between the input and output signals.

3,665,224

AMBIENT LIGHT LEVEL DETECTOR INCLUDING TRANSIENT SUPPRESSION CIRCUITRY

Newton D. Kelsey, Houston, Tex., assignor to Arthur P. Ruth

Filed Sept. 8, 1970, Ser. No. 70,025
Int. Cl. H01j 39/12
U.S. Cl. 307—311 2 Claims



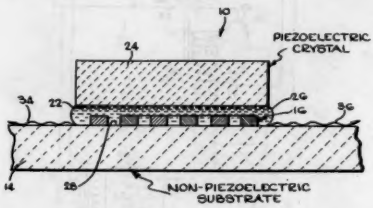
A circuit which includes a level detector circuit which is operated at two output levels, one level being indicative of a first ambient light condition and the second being indicative of another light condition, therebeing a timing circuit operated by the Schmitt trigger and an output circuit operated by the timing circuit after a predetermined delay to overcome transient and temporary changes in ambient light.

3,665,225

HYBRID SURFACE-WAVE TRANSDUCER

Anthony P. van den Heuvel, Homewood; Ronald B. Owen, Chicago, both of Ill., and Shrinivas G. Joshi, Bangalore, India, assignors to IIT Research Institute, Chicago, Ill.

Filed Aug. 28, 1970, Ser. No. 67,766
Int. Cl. H01v 7/00
U.S. Cl. 310—8.1 18 Claims



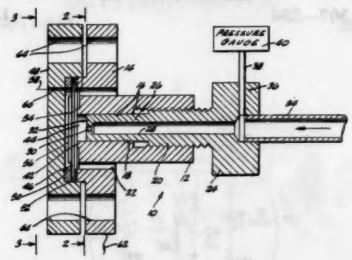
A transducer for generating and detecting surface elastic waves in a non-piezoelectric material may include an interdigital electrode array coupled to a piezoelectric crystal. The crystal is mechanically coupled to the non-piezoelectric material through an acoustical transmissive medium.

3,665,226

ELECTRIC POWER SOURCE

Robert A. Sinker, Beverly Hills, and George L. Williams, Santa Monica, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Continuation of application Ser. No. 725,726, May 1, 1968, now abandoned. This application July 13, 1970, Ser. No. 56,216
Int. Cl. H04r 17/00
U.S. Cl. 310—8.3 7 Claims



An electric generator operated by means of flow of fluid against a diaphragm to which a piezo-electric material is secured. The fluid flows into a cavity through an orifice and the fluid exhausts from the cavity between the diaphragm and a closely spaced annular shoulder. Pressure variations within the cavity caused by flexure of the diaphragm creates a self-sustained diaphragm vibration for generation of electricity by the piezo-electric material.

3,665,227

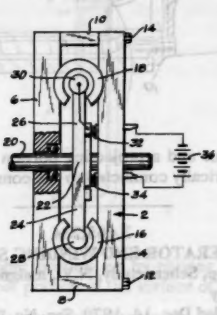
ELECTRIC MOTOR

Raymond W. Busch, 1701 N.W. 54th Terrace, Lauderhill, Fla.

Continuation-in-part of application Ser. No. 815,371, Apr. 11, 1969, now abandoned. This application Nov. 3, 1970, Ser. No. 86,466
Int. Cl. H02k 37/00
U.S. Cl. 310—46 8 Claims

An electric motor module for converting electromagnetic energy into rotational mechanical energy having at least one

snap-in electromagnetic coil fixed radially about a rotating member on a shaft with the north-south polar axis disposed circumferentially relative to the shaft. A printed or laminated circuit plate takes the place of the usual hub commutator and is fastened on one side of the member to complete the circuit with the coil. The shaft is rotatably coupled to a transparent frame having a plurality of fixed magnetic members also having their north-south polar axis circumferentially disposed



about the shaft and sufficiently adjacent said coil to provide magnetic interaction between the coil and the fixed magnetic members for rotating the shaft. Contact members mounted on one or both side plates constituting the frame extend to the contact surface of the circuit plates thereby completing the circuit for the reception of electrical current. Terminal posts also used as plugs either receive current wire or a negative wire for use of electricity or plug into another module to multiply the H.P. rating of the motor.

3,665,228

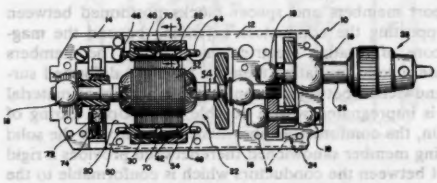
MODULAR DESIGN-DOUBLE INSULATED FIELD

Anthony Jacyno, Aurora, Ill., assignor to G. W. Murphy Industries, Inc., Houston, Tex.

Filed May 15, 1970, Ser. No. 37,810

Int. Cl. H02k *7/14*

U.S. Cl. 310—47 **7 Claims**



In a power tool, an electric motor is mounted on an electrically conductive frame by an electrically insulating shield member which directly insulates the motor from the frame and also shields the motor field magnets against spark-gap conduction of electricity to the frame, preventing possible shock to the user.

3,665,229

ROTARY CRYOGENIC MACHINERY

Hugh Olaf Lorch, Stafford, England, assignor to The English Electric Company Limited, London, England

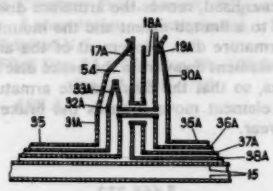
Filed Mar. 31, 1971, Ser. No. 129,712

Claims priority, application Great Britain, Apr. 3, 1970, 15,913/70

Int. Cl. H02k *9/00*

U.S. Cl. 310—52 **12 Claims**

Cryogenic machinery in which coolant fluid is supplied to a rotor via a central path, and disposed radially outwards in an annular flow space into axially extending cooling paths in the periphery of the body. Fluid is exhausted from the cooling paths via annular flow spaces at each end of the body into outlet paths concentric with the inlet path, and the outlet paths and inlet path are vacuum insulated from one another.



3,665,230

DEVICE FOR INCREASING THE INTENSITY OF GAS COOLING OF ELECTRICAL MACHINES WITH HIGH-SPEED ROTOR

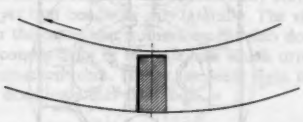
Mihaly Wallenstein, Budapest, Hungary, assignor to Ganz Villamossagi Muvek, Budapest, Hungary

Filed Oct. 19, 1970, Ser. No. 81,874

Claims priority, application Hungary, Dec. 30, 1969, GA-988/69

Int. Cl. H02k *9/06*

U.S. Cl. 310—60 **2 Claims**



A turbo-generator has a rotor having openings therethrough and stator windings also having openings therethrough, and ribs on the stator that extend toward but are spaced from the rotor and that are parallel to the axis of the rotor for augmenting the circulation of gas relative to the rotor surface and through the rotor.

3,665,231

AUTOMATICALLY ADJUSTABLE SINGLE DISC BRAKE FOR MOTORS

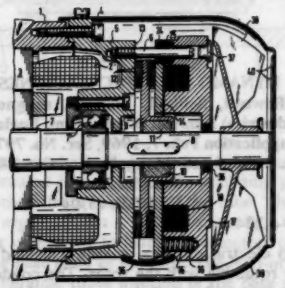
Guenther Wendler, Schwarzenbach, Saale, Germany, assignor to Adam Baumueller GmbH Fabrik Fur Elektrotechnik, Marktredwitz, Germany

Filed Mar. 18, 1970, Ser. No. 20,617

Claims priority, application Germany, Mar. 21, 1969, P 19 14 469.5

Int. Cl. H02k *7/102*

U.S. Cl. 310—77 **21 Claims**



A motor disc brake has a brake disc axially displaceable on

the motor shaft, a displaceable armature disc which is normally in engagement with the brake disc and a displaceable magnet mounting element supporting an electromagnet which, when energized, moves the armature disc away from the brake disc to a limited extent and the mounting element towards the armature disc. Movement of the armature disc and mounting element away from the brake disc is limited by locking devices, so that the displaceable armature disc and the mounting element move towards the brake disc as the brake linings wear.

3,665,232

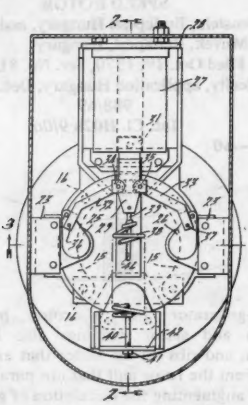
ELECTROHYDRAULIC CALIPER DISC BRAKE

Jaroslav Speransky, and Harry E. Cerny, both of Duluth, Minn., assignors to Microdot, Inc., Greenwich, Conn.

Filed Nov. 12, 1970, Ser. No. 88,635

Int. Cl. H02k 7/102

U.S. Cl. 310—77 **9 Claims**



A unit attached to the frame of a motor for insuring quick braking when the current is shut off. The unit comprises a housing enclosing a solenoid and supporting a pair of mechanical calipers on opposite sides of a disc secured to the motor shaft. A pair of opposed links connect the solenoid plunger to the calipers, and a spring urges the plunger toward a position setting the brake. When current is supplied to the motor it will energize the solenoid to release the brake. A hydraulically operated caliper brake is also mounted in the housing for alternate use.

3,665,233

DYNAMO ELECTRIC MACHINES

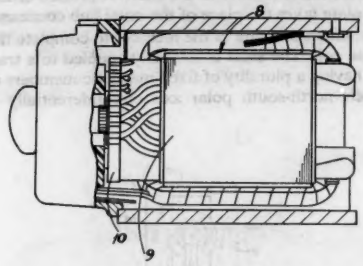
Roy Price Bowcott, Solihull, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Original application Feb. 7, 1969, Ser. No. 797,457, now abandoned. Divided and this application Oct. 28, 1970, Ser. No. 83,223

Int. Cl. H02k 13/04

U.S. Cl. 310—234 **4 Claims**

A dynamo electric machine having a wound rotor and a commutator rotatable with the rotor. The conductors of the rotor are in pairs each pair being connected electrically to a respective commutator segment. One end of one conductor of each pair is electrically and physically connected to the



other conductor and a projecting portion of said other conductor is electrically connected to the commuator segment.

3,665,234

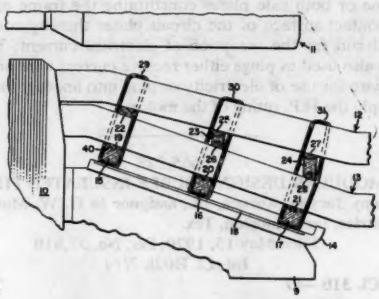
GENERATOR END WINDING SUPPORT

James S. Bishop, Schenectady, N.Y., assignor to General Electric Company

Filed Dec. 14, 1970, Ser. No. 97,777

Int. Cl. H02k 1/24

U.S. Cl. 310—260 **2 Claims**



Support members and spacer blocks positioned between and supporting the conductors extending beyond the magnetic core of rotating electrical machinery. The members comprise a solid insulating member having a deformed surface sandwiched between a conformable absorbent material which is impregnated with a curable resin. Upon curing of the resin, the comformable absorbent material with the solid insulating member sandwiched therebetween provides a rigid support between the conductors which is conformable to the space therebetween and which has its structural elements locked together for increased durability.

3,665,235

MERCURY VAPOR LAMP

Andre Albert Hugot, Asnieres, France, assignor to Compagnie Electro-Mecanique, Paris, France

Filed Apr. 21, 1970, Ser. No. 30,413

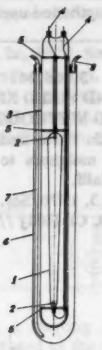
Claims priority, application France, Apr. 28, 1969, 6913435

Int. Cl. H01j 61/52

U.S. Cl. 313—23 **10 Claims**

In a doped mercury vapor lamp having an elongate vertical burner, an upper portion of the surface of the burner is maintained at a lower temperature than a lower portion to reduce separation of the dopant. Heat-emission from the upper portion of the surface of the burner may be increased compared to the lower portion of the burner by increasing the diameter

(and hence the heat-exchange area per unit length) in the upper portion, by reducing the thickness of an air gap to an



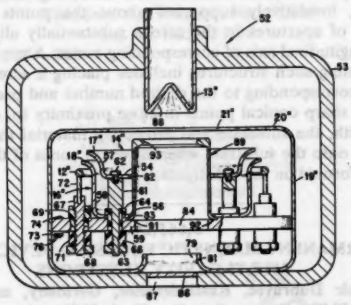
envelope in the upper portion, or by playing coolant selectively on to the upper portion of the surface of the burner.

3,665,236

ELECTRODE STRUCTURE FOR CONTROLLING ELECTRON FLOW WITH HIGH TRANSMISSION EFFICIENCY

Jerry L. Gaines; Paul J. Ebert; Lloyd Mancebo, and Frederick D. Cook, all of Livermore, Calif., assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed Dec. 9, 1970, Ser. No. 96,514
Int. Cl. H01j *35/04*
U.S. Cl. 313—55 **8 Claims**



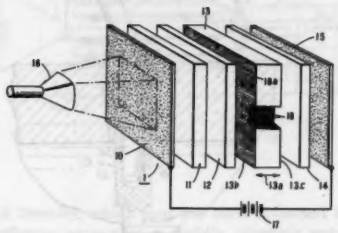
Electrode structure for controlling flow of electrons from a cathode to an anode, characterized by the absence of electrodes in the flow path whereby electron flow is substantially unimpeded by physical structure and proceeds with high transmission efficiency. The structure is such as to establish an electron accelerating field and associated flow path between cathode and anode which bulges outwardly about an interposed control electrode and is thus not physically intercepted by same. By virtue of the high efficiency of electron transmission, the electrode structure may be advantageously incorporated in an X-ray tube to provide X-ray pulses of increased intensity. In addition, the transmission characteristic in conjunction with the capability of the bulging field to enable the use of relatively small control voltages to govern electron flow render the electrode structure particularly well suited to the attainment of a high amplification factor in a high power amplifier tube for voltage regulation or switching applications.

3,665,237

IMAGE-RETAINING PANEL IMPERVIOUS TO AMBIENT LIGHT

Jeofry Stuart Courtney-Pratt, Locust, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Dec. 21, 1970, Ser. No. 100,168
Int. Cl. H01j *1/70*
U.S. Cl. 313—108 A **5 Claims**



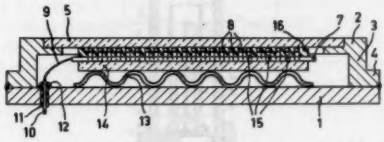
An image-retaining panel receives a momentarily projected image, and retains a replica of that image for extended periods irrespective of local lighting. The panel consists of a pair of electroluminescent slabs electrically connected by an opaque layer that conducts only laterally. The viewing image formed on the outer electroluminescent slab does not affect the photoconductivity of the medium which drives the inner electroluminescent slab. Hence, ambient light falling on the outer slab does not affect the image.

3,665,238

ELECTRIC GAS DISCHARGE TUBE HAVING VACUUM TIGHT SEALING MEANS FOR A PLURALITY OF SUPPLY LEADS POSITIONED CLOSE TOGETHER

Johannes Van Esdonk, and Joannes Franciscus Maria Janssen, both of Emmasingel, Eindhoven, Netherlands, assignors to U. S. Philips Corporation, New York, N.Y.

Filed June 11, 1970, Ser. No. 45,438
Claims priority, application Netherlands, June 13, 1969, 6909119
Int. Cl. H01j *17/16*
U.S. Cl. 313—220 **5 Claims**



A gas discharge tube having intersecting conductors which are loosely situated in grooves of an insulating plate having open sides remote from the base of the tube. The insulating plate is kept urged against a window plate by a spring. The electrodes are connected to lead-in conductors placed close together in the base plate of the tube. The lead-in conductors pass through ceramic tubes inserted in the base plate of the tube and are vacuum sealed by means of a vitreous insulating material.

3,665,239

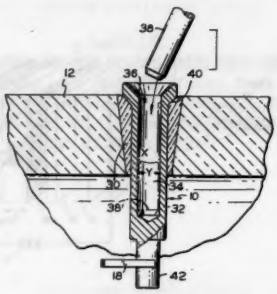
ELECTRICAL LEAD-IN TUBULAR SOCKET MEMBER FOR ELECTRONIC TUBES

Pierre C. Morinaud, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Continuation of application Ser. No. 766,912, Oct. 11, 1968, now abandoned. This application Nov. 12, 1970, Ser. No. 88,739

Int. Cl. H01j 5/50; H05k 5/06; H01r 9/12

U.S. Cl. 313—318 17 Claims



An electrical lead-in connector of low capacitance and high strength is described including a tubular socket member. The connector socket member is sealed within an aperture extending through an envelope wall and is provided with a pin receiving chamber open to the exterior of the envelope which has a length greater than its width. A lead attachment projection of solid metal is provided on the interior end of the socket member for welding an electrical lead thereto which may be connected to an electrode within the envelope of a cathode ray tube or other electrical device. The lead-in connector is provided with spring contacts within the pin receiving chamber for engagement with a connector pin inserted into the chamber, or the connector pin itself may be formed with leaf spring contacts or of a resilient member of twisted wire.

3,665,240

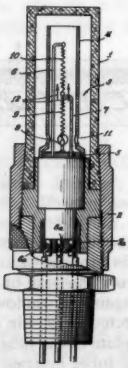
VARIABLE PITCH COIL FILAMENTS PROVIDING UNIFORM TEMPERATURE THROUGHOUT

Lee A. Archer, Wheaton, Ill., assignor to Erdco Engineering Corporation, Addison, Ill.

Continuation-in-part of application Ser. No. 696,835, Jan. 10, 1968, now Patent No. 3,522,010. This application June 15, 1970, Ser. No. 46,012

Int. Cl. H01j 5/50

U.S. Cl. 313—344 8 Claims



The catalytic metal filaments of gas detectors and the like are in coil form with progressively increasing pitch toward their middle portions whereby excessively high temperatures at such middle portions are avoided. The substantially uniform operating temperatures throughout most of the lengths of such coil filaments result in dependably good performance and greatly lengthened useful lives of the filaments.

3,665,241

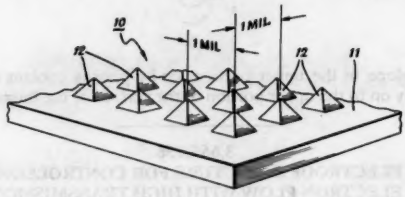
FIELD IONIZER AND FIELD EMISSION CATHODE STRUCTURES AND METHODS OF PRODUCTION

Charles A. Spindt, Menlo Park, and Louis N. Heynick, Palo Alto, both of Calif., assignors to Stanford Research Institute, Menlo Park, Calif.

Filed July 13, 1970, Ser. No. 54,222

Int. Cl. H01j 1/30

U.S. Cl. 313—351 11 Claims



Field-forming devices primarily useful as field ionizers and field emission cathodes and having as a basic element an array of closely spaced cones with sharp points supported on a substrate (in the most usual case conductive or semiconductive) are disclosed. Preferably, the field-forming structure is completed by a screen-like structure, e.g. as fine mesh screen, insulatively supported above the points with the center of apertures in the screen substantially aligned with the longitudinal axis of corresponding cones. A novel method of forming such structures includes placing a screen with a mesh corresponding to the desired number and packing density of sharp conical points in close proximity to, or in contact with, the substrate and projecting material through the screen onto the substrate whereby sharp cones of the material are formed on the substrates.

3,665,242

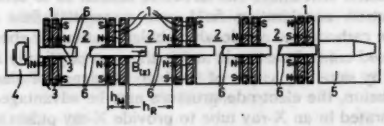
PERMANENT MAGNETIC FOCUSING DEVICE FOR MULTI-CAVITY KLYSTRONS

Vladimir Dubravec, Kastanienallee, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed July 1, 1970, Ser. No. 51,506

Int. Cl. H01j 23/08

U.S. Cl. 315—5.35 6 Claims



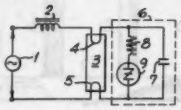
A permanent magnetic focusing device for periodically guiding the electron beams of multicavity klystrons comprising axially arranged magnets that are radially magnetized in the same sense.

3,665,243

DISCHARGE-LAMP OPERATING DEVICE USING THYRISTOR OSCILLATING CIRCUIT

Isao Kaneda, and Kiyokazu Takeuchi, both of Otsu, Japan, assignors to New Nippon Electric Company Ltd., Osaka, Japan

Filed Feb. 26, 1970, Ser. No. 14,325
Claims priority, application Japan, Feb. 27, 1969, 44/15106; Apr. 30, 1969, 44/34011; Apr. 26, 1969, 44/38565; June 10, 1969, 44/54290; June 16, 1969, 44/47720
Int. Cl. H05b *41/16, 41/20, 41/23*
U.S. Cl. 315—101 5 Claims



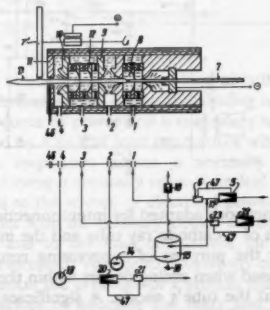
A circuit including a starting device and in which a discharge lamp is connected to the output terminal of a non-linear thyristor oscillator. The thyristor oscillator includes a first closed circuit comprising a power source, a choke coil and a capacitor. This first closed circuit is set for a first oscillating condition. A second closed circuit is also employed. It comprises an inductance element and a voltage responsive switch such as a thyristor which elements are connected to said capacitor. This second closed circuit is set for a second oscillating condition, preferably near resonance state. A high frequency transformer can be combined with the second closed circuit in order to realize a faster turning on or initiation of the discharge lamp. In a hot-cathode type discharge lamp, a third circuit for increasing preheating current is included in said oscillator circuit.

3,665,244

REGULATION OF PLASMA GENERATORS

Tibor Kugler, Sins, Switzerland, assignor to Lonza Ltd., Gampel/Valais (Direction: Basle), Switzerland

Filed June 2, 1970, Ser. No. 42,809
Int. Cl. H05b *31/26*
U.S. Cl. 315—111 12 Claims



For regulating the flows in a liquid stabilizing plasma generator a constant amount of stabilizing liquid, which is independent of the flow resistant of the generator, is supplied through at least one stabilizing liquid supply duct to the generator. Various means are employed for keeping the supply constant.

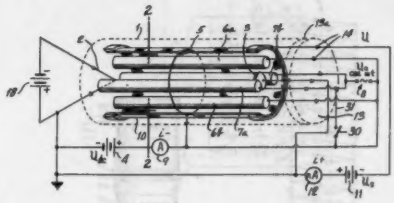
3,665,245

QUADRUPOLE IONIZATION GAUGE

Helmut J. Schwarz, Simsbury, Conn., assignor to Research Corporation, New York, N.Y.

Filed Oct. 27, 1969, Ser. No. 869,757
Int. Cl. G01n *27/62*
U.S. Cl. 315—111 10 Claims

A non-magnetic ionization gauge or ion pump comprising a tube containing spaced cathodes at the same potential, with an intermediately positioned ring anode for setting up an oscillating stream of electrons that is focused or constrained within an axial path by an electric quadrupole lens arrangement which may be excited by the RF force. The quadrupole lenses create a field which is tuned firstly to lengthen and stabilize the path of the electrons thus causing greater ionization of the gas atoms in the tube, and also to expel the ions



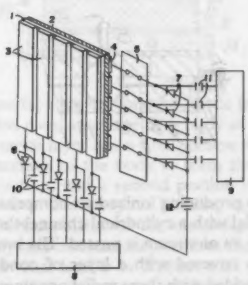
produced thereby, which ions are then collected by a cylindrical collector screen at a slightly negative potential surrounding the whole electrode structure. The collector current produced with this arrangement has been found to be approximately inversely proportional to the pressure within the range from 10^{-8} to 10^{-10} torr, so that collector currents of the order of microamperes can be obtained at very low pressure levels.

3,665,246

SOLID STATE DISPLAY DEVICE

Koichiro Kurahashi, Osaka, and Shigeki Ikebata, Takatsuki, both of Japan, assignors to Mitsubishi Electric Corporation, Tokyo, Japan

Filed June 8, 1970, Ser. No. 44,176
Claims priority, application Japan, June 14, 1969, 44/46967
Int. Cl. H05b *37/00*
U.S. Cl. 315—169 R 9 Claims



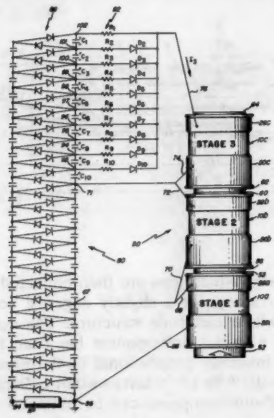
A solid state display device has stripe type conductive electrodes on both sides of an electroluminous layer in differing and crossing directions to each other to provide a matrix arrangement for selectively enabling a desired image to be formed. A non-crystalline switching type semiconductor is placed on said electroluminous layer to provide a memory capability for the display device upon obtainment of a light image. Switching elements are connected to each stripe type conductive electrode to enable the selective control of luminescence at a matrix point. The switch elements are selectively turned on and off in accordance with the generating of initiating pulses from a pair of electrode sources, whereby the image is controlled in the desired manner.

3,665,247

POWER REGULATING MEANS FOR LIGHT AMPLIFIER TUBES

Jeffrey L. Gordon, Spring Valley, Calif., assignor to Machlett Laboratories, Incorporated, Springdale, Conn.

Filed July 2, 1970, Ser. No. 52,034
Int. Cl. H05b 37/00
U.S. Cl. 315—205 9 Claims



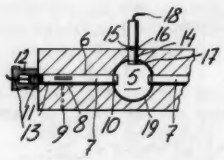
A light amplifier tube having a voltage source and circuit means connected between the cathode and the anode of the tube for regulating the power supplied to the tube and thereby controlling the output brightness of the tube.

3,665,248

DEVICE FOR PRODUCING IONIZED AIR

Paul A. Forslind, Karstorpsvagen 4, Vastervik, Sweden

Filed Feb. 13, 1970, Ser. No. 11,083
Int. Cl. H05b
U.S. Cl. 317—4 4 Claims



A device for producing ionized air comprises a block of insulating material with a cylindrical channel through the block through which an airstream is passed. The interior portion of the channel is covered with a layer of conducting material and is also provided with three radial openings through which extend a positive terminal of a voltage source and two negative-ion generators.

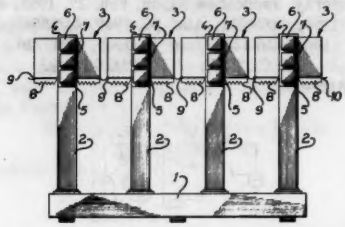
3,665,249

HIGH VOLTAGE DIRECT CURRENT CIRCUIT BREAKER

Vladislav Zajic, Montreal, Quebec, Canada, assignor to Institut De Recherche De L'Hydro-Quebec, Varennes, Province of Quebec, Canada

Filed Oct. 28, 1970, Ser. No. 84,576
Claims priority, application Canada, Sept. 8, 1970, 92,579
Int. Cl. H02h 7/22
U.S. Cl. 317—11 C 8 Claims

A high voltage direct current circuit breaker comprising several modules connected in series, each module including an electrodynamic mechanism connected to the mobile contacts of the circuit breaker and permitting to open very rapidly such contacts under load thus creating an electric arc between the contacts. Each module includes at least one deionizing chamber comprising a suitable number of parallel metallic plates disposed perpendicularly to the electric arc to form quenching channels for the electric arc. Finally, each



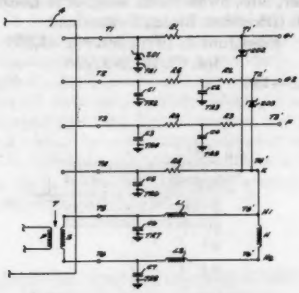
module comprises at least one magnetic arc extinguishing system for deflecting the electric arc of the contacts into the deionizing chamber and for forcing such arc to enter into the quenching channels to break it into a number of short arcs so as to create an arc voltage which is higher than the nominal voltage of the circuit, and for quenching such small arcs and finally extinguish them.

3,665,250

OVERLOAD CURRENT SUPPRESSION CIRCUIT NETWORK

Walter D. Bales, III, Garden Grove, and Neal H. Cosand, Fullerton, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed May 19, 1970, Ser. No. 50,002
Int. Cl. H02h 9/04
U.S. Cl. 317—16 5 Claims



A circuit network adapted for interconnection between the electron gun of a cathode ray tube and the intensity coupler therefor for the purpose of suppressing resultant overload currents caused when arcing occurs within the tube in a path originating at the tube's anode. A significant feature of the network is its ability to provide protection against serious malfunctioning of related circuitry especially overload current sensitive microcircuitry. The network greatly limits both the achievable levels of overload currents and rate of change thereof with attendant benefits.

3,665,251

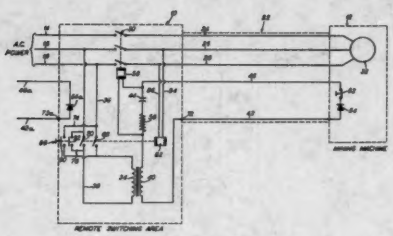
CONTINUOUS GROUND MONITORING CIRCUIT

Roger M. Buckeridge, Downers Grove, Ill., assignor to Westinghouse Air Brake Company, Pittsburgh, Pa.

Filed May 14, 1971, Ser. No. 143,460
Int. Cl. H02h 3/16
U.S. Cl. 317—18 A 3 Claims

A fail-safe continuous ground monitoring circuit formed by ground and check wires extending between a remote

switching area and a mobile machine or point of use. The monitoring circuit is arranged to hold main power contactors closed, at the remote switching area, only as long as there is a satisfactory ground for the machine and as long as the monitoring circuit is functioning properly. In the event a fault or



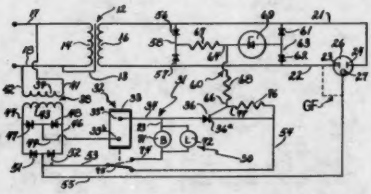
short occurs in the ground or check wires, the monitoring circuit automatically causes the main power contactors to open, removing power from the machine, and at the same time deenergize a control relay to remove all power from the monitoring circuit.

3,665,252

ELECTRICAL PROTECTIVE CIRCUIT

Charles J. Rogers, Sr., 1312 Coosaw Drive, Charleston, S.C., and Paul E. Stanley, 100 Hideway Lane, West Lafayette, Ind.

Filed July 17, 1970, Ser. No. 55,788
Int. Cl. H02h *3/16*
U.S. Cl. 317—18 D **2 Claims**



A protective circuit for an isolated load circuit utilizing an isolation transformer having a primary winding connected to an associated source of power and a secondary winding connected to a load by a pair of load conductors which includes fault condition responsive means, a normally inoperative control circuit having a normally open electrical valve and a relay connected to the source of electrical power by an auxiliary transformer with an auxiliary circuit connected to the control circuit and to the load conductors for closing the valve at a predetermined voltage to operatively condition the control circuit upon the presence of a ground fault on one of the load conductors to energize the relay and actuate the fault condition responsive means.

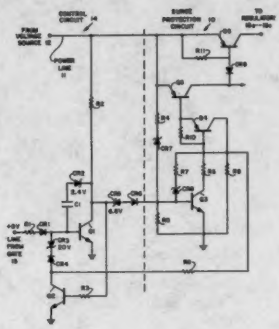
3,665,253

SHORT CIRCUIT PROTECTION DEVICE FOR MULTIPLE POWER SUPPLIES

Richard D. Stefani, Le Roy, N.Y., assignor to GTE Sylvania Incorporated

Filed Dec. 2, 1970, Ser. No. 94,376
Int. Cl. H02h *7/20*
U.S. Cl. 317—22 **4 Claims**

A short circuit protection device includes a surge protection circuit having first and second input connections coupled to a voltage source and a control circuit, respectively, and an output connection coupled to a plurality of voltage regulator circuits. The output voltages of the regulator circuit are sensed through a gate circuit by the control circuit. In the event one of the regulator output voltages goes to zero, the



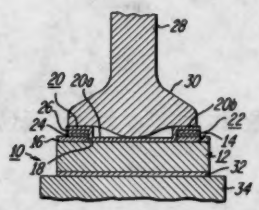
control circuit directs a control signal to the surge protection circuit which then disconnects the voltage source from the plurality of regulator circuits.

3,665,254

SEMICONDUCTOR DIODE

Jacques Roger Collard, Trenton; Subrahmanyam Yegna Narayan, Cranbury, and John Paul Paczkowski, Scotch Plains, all of N.J., assignors to RCA Corporation

Filed Oct. 12, 1970, Ser. No. 79,981
Int. Cl. H01l *3/00, 5/00*
U.S. Cl. 317—234 R **4 Claims**



A Schottky surface barrier junction diode in which a metal layer is provided over a surface of a body of semiconductor material. The metal layer has a first portion which is in contact with the surface of the body to form the Schottky surface barrier junction, and a second portion which is spaced from the surface of the body. A bonding layer is provided between the second portion of the metal layer and the surface of the body and mechanically secures the metal layer to the body. A terminal lead is in contact with the metal layer and is bonded only to the second portion of the metal layer so that the terminal lead is mechanically secured to the body without disrupting the Schottky surface barrier junction.

3,665,255

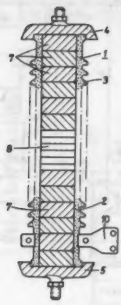
OVERVOLTAGE ARRESTER

Werner Jakszt; Gert Schiele, and Wolfgang Werner, all of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Berlin, Munich, Germany

Filed Sept. 4, 1970, Ser. No. 69,624
Claims priority, application Germany, Sept. 9, 1969, P 19 46 416.5
Int. Cl. H02h *9/06*
U.S. Cl. 317—68 **3 Claims**

An overvoltage arrester has a stack of spark gap assemblies, each having two disc-shaped metallic electrodes and a

weakly conductive spacer member disposed between the two electrodes and forming a current limiting resistor in addition to the spacer function. Each of the spacer members is constituted by a ring which has a generally Z-shaped cross-section thus forming a step configuration of an inner ring portion integrally joined with an outer portion of larger diameter. The outer portion surrounds the inner portion of the next adjacent ring in the stack, the spacer member proper being constituted substantially only by the inner portion of the ring.

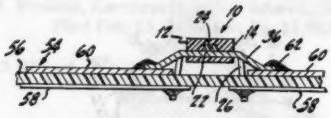


3,665,256

HEAT DISSIPATION FOR POWER INTEGRATED CIRCUITS

Nathan M. Goun, Metuchen, and Carl F. Wheatley, Jr., Somerset, both of N.J., assignors to RCA Corporation

Filed Oct. 15, 1968, Ser. No. 767,753
Int. Cl. H01l *1/12*
U.S. Cl. 317—100 **3 Claims**



An integrated circuit chip having circuit elements capable of relatively high power operation is encapsulated in a body of polymeric material having the form of an elongated rectangular prism. Conductors are electrically coupled to the elements in the integrated circuit chip and extend outwardly of the body of polymeric material through its relatively long sides. Heat conductors thermally coupled to the integrated circuit chip extend outwardly of the package through the same sides as the electrical conductors and are adapted to couple the integrated circuit chip to an external heat dispersing means.

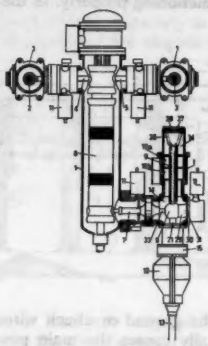
3,665,257

METAL CLAD SWITCH-GEAR FOR HIGH VOLTAGE COMPRISING CABLE TERMINAL BOXES

Aart Arnoldus De Heus, De Meern, Netherlands, assignor to N.V. "COQ", Utrecht, Kanaalweg, Netherlands

Filed Oct. 5, 1970, Ser. No. 77,859
Claims priority, application Netherlands, Nov. 5, 1969, 69.16682
Int. Cl. H02b *1/20, 3/00, 13/06*
U.S. Cl. 317—103 **10 Claims**

Metal-clad switchgear for high voltage comprising at least one cable terminal, of which the terminal members for the cable are connected by means of a conductor extending insulatedly through the wall of the envelope of the switchgear with the fixed contact of a detachable plug-and-bushing-connection accommodated in a compartment of said envelope, the movable contact of said plug-and-bushing-connection being in permanent contact with a stationary connecting element of the switchgear and mounted for operation from outside said envelope in order to enable the switchgear to be disconnected from the cable.

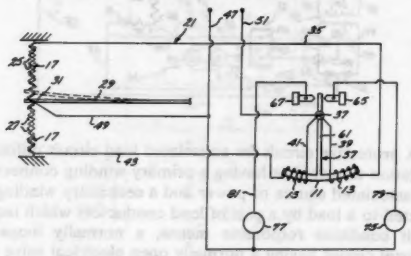


3,665,258

ARMATURE CONROL SYSTEM

Harold A. McIntosh, South Pasadena, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

Original application Mar. 7, 1969, Ser. No. 805,138, now Patent No. 3,577,066. Divided and this application Mar. 10, 1971, Ser. No. 122,728
Int. Cl. H01h *47/26*
U.S. Cl. 317—132 **10 Claims**

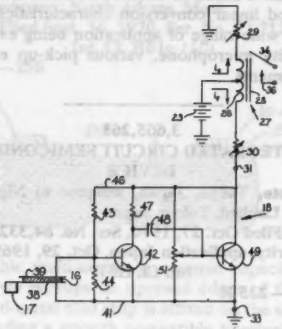


An armature control system including coil means for controlling positioning of a movable armature. Electrical resistance means is provided which has transverse portions in heat exchange relationship with each other and flexible for movement toward and away from one another to adjust the heat exchange relationship, the electrical resistance of the portions being temperature responsive so current flow therethrough is responsive to the temperature thereof. Adjustment means is provided for moving the portions toward and away from one another to adjust the proximity thereof and alter mutual heat transfer therebetween so the electrical current passing through the resistance means is correspondingly adjusted. Circuit means connects the resistance means with the coil means so the adjustment means may be adjusted to adjust the spacing between the transverse portions to alter the heat exchange relationship therebetween and adjust the current flow through the coil means to thereby adjust the electromagnetic force on the armature to effect movement thereof.

3,665,259
VIBRATION TRANSDUCER FOR BURGLAR ALARMS AND THE LIKE

Harrison D. Brailsford, Milton Point Road, Rye, N.Y.

Filed Aug. 19, 1970, Ser. No. 64,968
Int. Cl. H01v 7/00
U.S. Cl. 317—144 2 Claims

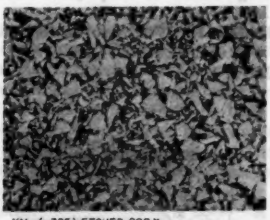


A sensing device constructed on a support to be attached to a safe or the like and having an electrical signal generator, such as a piezoelectric crystal, rigidly attached to the support at one end and freely movable at the other end to generate a voltage in response to vibrations of the safe. A feedback amplifier amplifies this voltage to produce a resultant output signal for connection to an alarm. The amplifier includes input and output stages and a controllable positive feedback loop to provide a two-terminal replacement for a carbon granule transducer.

3,665,260
ALLOY CAPACITOR POROUS ANODES

Milton E. Kirkpatrick, Palos Verdes Peninsula, and Ralph A. Mendelson, Westminster, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed June 1, 1970, Ser. No. 42,087
Int. Cl. H01g 9/00, 3/075
U.S. Cl. 317—230 16 Claims



YAL (~325) ETCHED 200 X

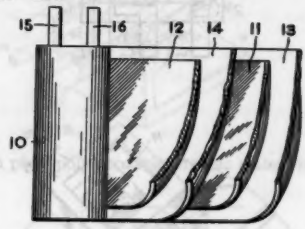
Alloys of intermetallic compounds and solid solutions are prepared as powders, compacted, and sintered at high temperatures to form porous, single phase alloys; the porous alloys are then surface-oxidized such as by anodization to form a mixed metal oxide film on the surfaces of the porous structure. This results in a mixed metal oxide surface film having good dielectric properties. The placement of conductive material in the void space of the porous anode results in the formation of a capacitor structure of superior properties.

The general formula for the sintered alloys is AB where A and B are metals in the form of solid solutions or intermetallic compound alloys. Of specific interest are those 1:1 compounds which form ABO_3 oxides. Preferred materials include YaI, CoTi and NiTi alloys. These AB sintered alloys are oxidized or anodized to form surface films of ABO_3 and A_xB_yO

3,665,261
ELECTROLYTIC CAPACITOR WITH IMPROVED ELECTROLYTE

Franz S. Dunkl, Williamstown, Mass., assignor to Spraque Electric Company, North Adams, Mass.

Filed Sept. 25, 1970, Ser. No. 75,588
Int. Cl. H01g 9/02
U.S. Cl. 317—230 3 Claims

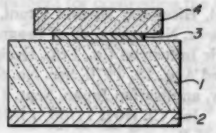


A glycol-pentaborate electrolyte, such as those commonly employed in photoflash capacitors, is improved by the addition of 0.0025–0.006 percent chromium ions thereto in the form of CrO_3. The addition of said chromium ions increases the breakdown voltage therein, and practically eliminates breakdowns during the aging process.

3,665,262
SEMICONDUCTOR PRESSURE-ELECTRIC TRANSDUCER INCLUDING A SEMICONDUCTOR ELEMENT HAVING A DEEP LEVEL IMPURITY AND A SEMICONDUCTOR PRESSURE TRANSMITTING PLATE

Akio Yamashita, Ikeda-shi, and Tadashi Yamada, Suita-shi, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed July 14, 1969, Ser. No. 841,281
Claims priority, application Japan, July 19, 1968, 43/51417
Int. Cl. H01l 3/00, 5/00
U.S. Cl. 317—234 R 1 Claim



In a semiconductor pressure-electric transducer comprising a semiconductor element which contains a deep level impurity and whose electric resistance varies with a pressure applied thereto, a structure of the plate for transmitting a pressure applied to said transducer to said semiconductor element.

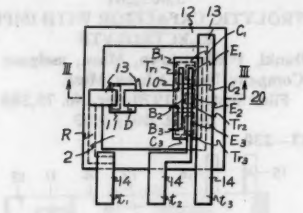
3,665,263
IMPROVEMENTS IN AIR-ISOLATED INTEGRATED CIRCUIT DEVICES TO FACILITATE THE CONNECTION THEREOF TO CIRCUIT BOARDS

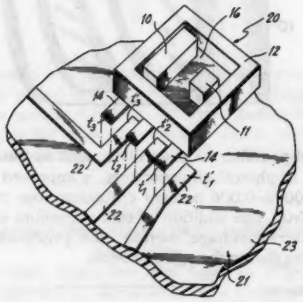
Katsuhiko Akiyama, 1311-2 Hase, Atsugi, Japan

Continuation-in-part of application Ser. No. 747,360, July 24, 1968, now abandoned. This application June 5, 1970, Ser. No. 43,667
Int. Cl. H01l 19/00
U.S. Cl. 317—235 R 7 Claims

An integrated circuit device has a frame of semiconductor material and blocks of the same semiconductor material situ-

ated in a space or spaces substantially enclosed by the frame, with the blocks being spaced from the frame and having circuit elements therein which are interconnected by beam leads also functioning as the sole means mechanically coupling or locating the blocks relative to the frame. Certain





of the beam leads project beyond the periphery of the frame and all of the beam leads are substantially coplanar and constitute the highest elevations on the circuit device so that the projecting beam leads can be conveniently bonded to conductive areas on a substrate, such as a circuit board, defining external circuits.

3,665,264

STRESS SENSITIVE SEMICONDUCTOR ELEMENT HAVING AN N^+PP^+ OR P^+NN^+ JUNCTION

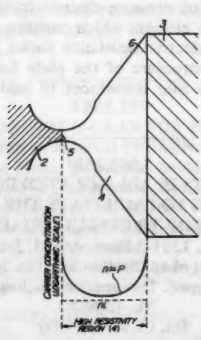
Noboru Yukami, Hirakata; Hiroshi Otani, Shijonawate, and Hideo Kurokawa, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Aug. 18, 1970, Ser. No. 64,696

Claims priority, application Japan, Sept. 1, 1969, 44/70415

Int. Cl. H01l *11/00, 15/00*

U.S. Cl. 317—235 R **7 Claims**



A stress sensitive semiconductor element comprising first and second low-resistivity regions of different conductivity types formed in a common semiconductor substrate, and a third region of a higher resistivity and of the same conductivity type as that of said first region, said third region being formed between said first and second regions in said common semiconductor substrate, and a constricted portion being formed at the non-rectifying contact between said first and third regions, wherein the length of said third region is longer than the effective diffusion distance of carriers; such a device having a good linear conversion characteristics and a high sensitivity, a wide range of application being expected for a high sensitivity microphone, various pick-up elements and switching elements.

3,665,265

MOS INTEGRATED CIRCUIT SEMICONDUCTOR DEVICE

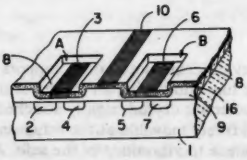
Syoji Fujimoto, Tokyo, Japan, assignor to Nippon Electric Company, Limited, Tokyo, Japan

Filed Oct. 27, 1970, Ser. No. 84,332

Claims priority, application Japan, Oct. 29, 1969, 44/86216

Int. Cl. H01l

U.S. Cl. 317—235 R **2 Claims**



An MOS integrated circuit having a duplex insulating material structure wherein an aluminum oxide layer is disposed over the silicon oxide layer. Gate insulating material is protected against contamination from organic solvent and photoresist. In an n-channel device, the threshold voltage of the thick insulating material is increased to thereby reduce the likelihood of parasitic or leakage conduction between adjacent MOS transistors in the circuit.

3,665,266

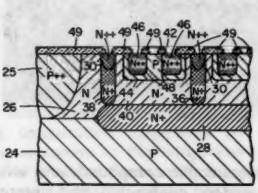
LOW SATURATION RESISTANCE, LOW OFFSET VOLTAGE, MONOLITHIC ANALOG SWITCH

Kenneth Paul Drozdowicz; William Rey Fowler, both of Scottsdale, and George Averkiou, Temple, all of Ariz., assignors to Motorola, Inc., Franklin Park, Ill.

Filed Dec. 10, 1970, Ser. No. 96,787

Int. Cl. H01l *11/06*

U.S. Cl. 317—235 R **3 Claims**



A low saturation resistance, very low offset voltage, monolithic, analog switch is provided which has high impedance in the off state; this switch being produced by fabricating a transistor on a chip. The transistor is adapted to have its base collector junction forward biased and its emitter base junction reverse biased. The parasitic action of a further transistor including the base and the collector of the inversely biased transistor and the substrate on which the inversely biased transistor is deposited, is eliminated. The inverse beta

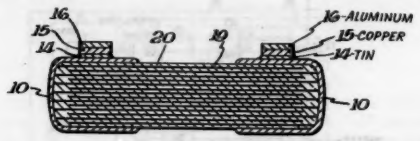
of the transistor switch is increased, and also the distributed current crowding effects in the so provided transistor is minimized.

3,665,267

CERAMIC CAPACITOR TERMINALS

Salvatore J. Acello, North Adams, Mass., assignor to Sprague Electric Company, North Adams, Mass.

Filed Sept. 16, 1970, Ser. No. 72,712
Int. Cl. H01g 1/14
U.S. Cl. 317—258 5 Claims



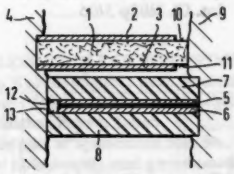
A monolithic multi-electrode ceramic capacitor chip has silver electrode pickups on opposed edges of the capacitor stack. A multi-metal clad strip is affixed on the silver pickup, thereby affording a smooth compatible terminal surface for further bonding purposes for use in hybrid circuitry.

3,665,268

IMPREGNATED ELECTRICAL CAPACITOR

Reinhard Behn, Munich; Karl-Heinz Preissinger, Taufkirchen, and Reiner Simson, Munich, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed May 6, 1971, Ser. No. 140,867
Claims priority, application Germany, May 12, 1970, P 20 23 193.0
Int. Cl. H01g 1/00
U.S. Cl. 317—258 4 Claims



An impregnated capacitor which has an especially coiled body of alternate layers of an insulating band such as paper and a pair of plastic dielectric bands such as polypropylene bands with one charge-carrying layer being formed by metalized surface coatings on the insulating band and the other charge-carrying later being formed by facing surface coatings on each of the pair of dielectric bands. The entire coiled body is impregnated with an oil to remove any air gaps between the layers by causing the swelling of the plastic dielectric bands.

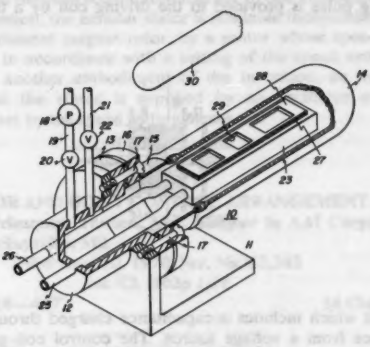
3,665,269

CAPACITORS HAVING A PHOTOPOLYMERIZED DIELECTRIC FILM

Archibald N. Wright, Schenectady, and Richard C. Merrill, Glen Falls, both of N.Y., assignors to General Electric Company

Continuation of application Ser. No. 530,813, Mar. 1, 1966, now abandoned. This application Dec. 29, 1969, Ser. No. 888,524
Int. Cl. H01g 1/00
U.S. Cl. 317—258 6 Claims

Capacitors are provided having a first metal substrate, a dielectric film on such substrate and a second electrode on the dielectric film which is made by the photopolymerization of certain photopolymerizable organic materials in vaporous form.

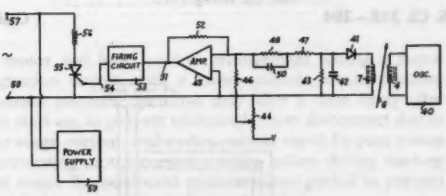


3,665,270

ELECTRIC TRANSDUCERS FOR TENSION CONTROL IN A WINDING DEVICE

Peter John Henry Ayers, Lowestoft, England, assignor to T. V. Manufacturing Limited, Suffolk, England

Continuation-in-part of application Ser. No. 792,698, Jan. 21, 1969. This application Nov. 9, 1970, Ser. No. 87,701
Claims priority, application Great Britain, Jan. 23, 1968, 3,573/68
Int. Cl. B65h 59/38
U.S. Cl. 318—6 2 Claims



A winding arrangement for controlling the tension in a filament or web being wound includes an electrical transducer comprising a first winding carried by a core of ferromagnetic material, a second winding carried by a separate core of ferromagnetic material which is spaced from said first core and a movable member of electrically conducting material which can be moved into and out of the gap between the cores and which is connected to a dancer arm resting on the web or filament to be wound. The varying output signal produced by the transducer with movement of the dancer arm is employed to control the drive means to the winding spindle in order to keep the tension in the web or filament substantially at the correct value.

3,665,271

DRIVING CIRCUIT FOR A TIME-KEEPING DEVICE

Friedrich Assmus, Schramber/Wurttemberg, and Wolfgang Ganter, Schramber-Sulgen/Wurttemberg, both of Germany, assignors to Firma Gebruder Junghans G.m.b.H., Schramberg/Wurttemberg, Germany

Continuation-in-part of application Ser. No. 647,554, June 20, 1967, now abandoned. This application Sept. 8, 1970, Ser. No. 70,083
Claims priority, application Germany, June 23, 1966, J 31 155
Int. Cl. H02k 29/00
U.S. Cl. 318—138 6 Claims

A driving circuit for initiating oscillatory or rotary move-

ment in a mechanical system wherein a control coil and driving coil are mounted in coupled relationship between opposing pole faces of a permanent magnet system and an initial driving pulse is provided to the driving coil by a transistor

circuit which includes a capacitance charged through a resistance from a voltage source. The control coil generates pulses to operate the transistor circuit and provide output driving pulses to the driving coil to maintain the oscillatory or rotary movement of the system.

3,665,272

ARRANGEMENT FOR BRAKING A THREE-PHASE MOTOR DRIVEN HOIST

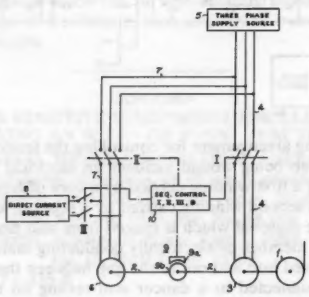
Gustav Spiess, deceased, late of Zug, Switzerland; Lina Spiess-Guttinger, Zug; Peter Spiess, Zug; Marianne Spiess, Zug; Hansjorg Spiess, Zug, and Walter Spiess, Oberrohrdorf, all of Switzerland (heirs), assignors to Aktiengesellschaft Brown, Boveri & Cie., Baden, Switzerland

Filed Nov. 6, 1970, Ser. No. 87,441

Claims priority, application Switzerland, Nov. 7, 1969, 16577/69

Int. Cl. H02p *3/18*

U.S. Cl. 318—204 **1 Claim**



A braking system for a hoist driven by a polyphase drive motor includes a polyphase eddy current braking machine coupled to the hoist and which has a larger number of poles than the drive motor and a solid rotor. To initiate a braking function after the drive motor has been disconnected from its polyphase power supply source, the stator of the eddy current braking machine is first connected to the polyphase power supply which dynamically reduces the normal hoist speed to a lower value determined by the pole ratio between the drive motor and braking machine. Thereafter, the stator of the braking machine is disconnected from the polyphase power supply source and connected to a direct current power supply source which dynamically effects a further reduction in speed of the hoist to a near stand still level, after which the hoist is then brought to a complete stop by means of a further braking device such as a mechanical brake.

3,665,273

POLYPHASE ALTERNATING CURRENT FREQUENCY VARIATOR FOR INDUCTION AND SYNCHRONOUS TYPE MOTOR

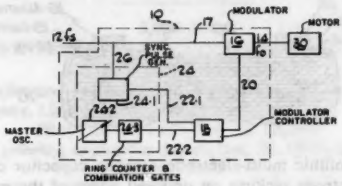
Nicholas Charl de Villiers Enslin, 7 Longacres, Sans Souci Road, Newlands, Cape Providence, Republic of South Africa

Filed Aug. 11, 1969, Ser. No. 848,944

Claims priority, application South Africa, Aug. 15, 1968, 68/5306

Int. Cl. H02p *5/40*

U.S. Cl. 318—227 **4 Claims**



A frequency variator for controlling the speed of polyphase alternating current induction and synchronous type motors. The frequency of the A.C. power supply to the motor is varied by controlling the firing of power control gates in series with the motor windings in an ordered sequence.

3,665,274

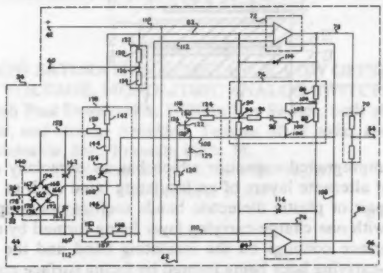
REVERSIBLE MOTOR CONTROL HAVING ALTERNATIVELY OPERATIVE DUAL AMPLIFIERS AND AUTOMATIC RESPONSE ADJUSTMENT

Norman E. Born; Edwin E. Kolatorowicz, and Harry A. Plumb, Jr., all of Erie, Pa., assignors to General Electric Company

Filed May 5, 1970, Ser. No. 34,709

Int. Cl. H02p *5/06*

U.S. Cl. 318—257 **8 Claims**



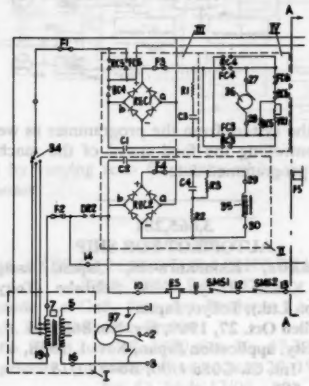
A drive system including a d-c motor has improved control means for generating a regulated control signal for controlling the supply of electric power to the motor. The control system includes a first amplifier operative when a net positive input signal is supplied thereto, a second amplifier operative when a net negative input signal is supplied thereto, means for supplying a command signal having a polarity and magnitude representative of desired motor performance to each amplifier, means for supplying a negative polarity signal representative of actual motor performance to the first amplifier and a positive polarity signal representative of actual motor performance to the second amplifier, and means for producing in response to the output of said amplifiers the regulated control signal. The control system also includes stabilizing means common to the two amplifiers and means for automatically adjusting the response of the amplifiers.

3,665,275

DRIVE APPARATUS FOR PRINT ROLLERS FOR PRINTING MACHINERY

Thomas Robinson, Reading, Berkshire, England, assignor to Antoma (Hairdressing) Company Limited

Filed Aug. 22, 1969, Ser. No. 852,329
Claims priority, application Great Britain, Aug. 28, 1968, 41,169/68
Int. Cl. H02p 3/14
U.S. Cl. 318—261 3 Claims



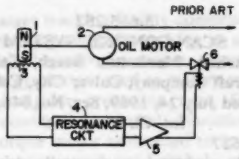
Means for controlling a shunt wound motor for driving the printing roller of a printing machine which includes electrical circuits for controlling the speed of rotation of the motor and for applying a braking force to the motor at the end of the printing operation, which force is proportional to the speed of the motor.

3,665,276

SPEED CONTROLLER FOR PRIME MOVER

Masaru Fujii; Kazuo Sagara, and Shuichi Isomura, all of Nagasaki-ken, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of application Ser. No. 766,717, Oct. 11, 1968, now abandoned , and a continuation-in-part of 766,718, Oct. 11, 1968, now abandoned. This application Mar. 6, 1969, Ser. No. 804,971
Int. Cl. H02p 5/06
U.S. Cl. 318—318 1 Claim



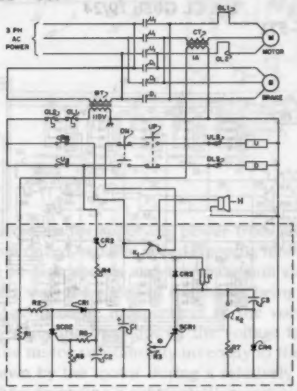
A speed controller for a prime mover includes a permanent magnet rotor, rotated at a speed corresponding to the speed of the prime mover, and an annular stator provided with an output winding connected, through an amplifier, to a throttle or the like controlling the speed of the prime motor. The rotation of the permanent magnet rotor developes a voltage in the output winding at a first frequency corresponding to the speed of the prime mover. Speed setting means are coupled with the stator to develop, in the output winding, a voltage at a second frequency corresponding to a desired speed of the prime mover as set by the speed setting means. The output winding thus supplies to the throttle or the like a control voltage at a frequency which is the difference between the first and second frequencies. In one embodiment of the invention, the annular stator is rotatable independently of the permanent magnet rotor, by a motor whose speed is controlled in accordance with a setting of the speed setting means. In another embodiment of the invention, an input winding on the stator is supplied by an oscillator at a frequency set by the speed setting means.

3,665,277

MOTOR AND HOIST CONTROL ARRANGEMENT

Edward Velazquez, Towson, Md., assignor to AAI Corporation, Cockeysville, Md.

Filed Aug. 10, 1970, Ser. No. 62,342
Int. Cl. H02p 1/26
U.S. Cl. 318—447 16 Claims



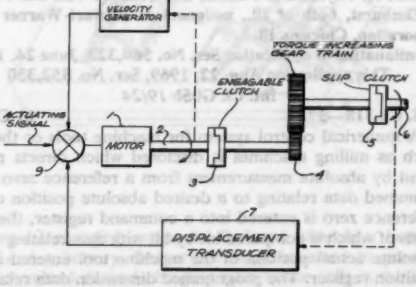
A motor and hoist control arrangement having a motor energization circuit, with a motor current sensitive power disconnect network operative only after a time delay after motor start-up, to prevent undesired power disconnect due to motor surge current, and motor-current signal by-pass means for preventing motor current sensing action during start-up of the motor for a selected predetermined period to prevent power disconnect action during such period.

3,665,278

COMPACT SERVO ACTUATOR

Edward Kazmarek, Reseda, Calif., assignor to Lear Siegler, Inc., Santa Monica, Calif.

Filed Feb. 12, 1970, Ser. No. 10,756
Int. Cl. G05b 5/01
U.S. Cl. 318—466 13 Claims



An engageable clutch is connected to the output shaft of a motor. The clutch is coupled to a servo actuator output shaft

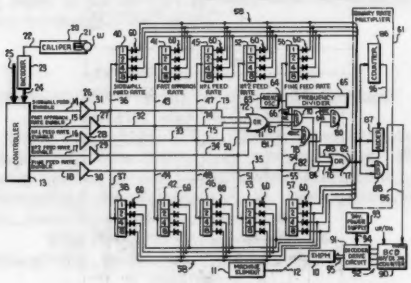
by a gear train that increases the motor torque. A slip clutch is disposed between the gear train and the servo actuator output shaft. A displacement transducer is coupled to the servo actuator output shaft and a velocity generator is coupled to the motor output shaft. The motor actuating signal, the output of the displacement transducer, and the output of the velocity generator are applied to the inputs of a summing junction that drives the motor. A housing encloses all of the components of the servo actuator to form a compact package capable of delivering large torque. The gear train is arranged in multiple columns that transmit torque to the output shaft in a back and forth path.

3,665,279

CONTROL SYSTEM FOR A MACHINE TOOL

Michael D. McIntosh, Greencastle, Pa., assignor to Landis Tool Company, Beverly Hills, Calif.

Filed June 12, 1970, Ser. No. 45,832
Int. Cl. G05b *19/24*
U.S. Cl. 318—571 **30 Claims**



A control system for a machine tool which utilizes an electro-hydraulic pulse motor to move a machine tool element is described. The pulse motor is energized from a decoder drive circuit which receives signals from a binary coded decimal counter having its input coupled to the output of a binary rate multiplier. The binary rate multiplier, in turn, receives as its inputs pulses of predetermined repetition rates from a crystal controlled frequency divider and preselected binary coded decimal signals from one or another of a plurality of rate sources. A controller is arranged, via logic circuits, to select one or another of various outputs from the frequency divider as one of the inputs to the binary rate multiplier. The controller also selects which of the plurality of rate sources provides a binary coder decimal signal to the rate multiplier.

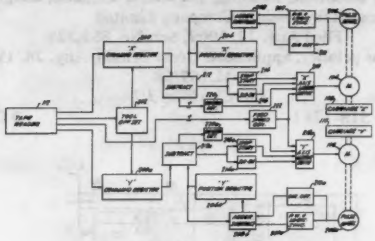
3,665,280

ZERO OFFSET NUMERICAL SERVO MACHINE CONTROL SYSTEM

Robert A. Payne, Des Plaines, and John F. Van Der Molen, Elmhurst, both of Ill., assignors to Stewart-Warner Corporation, Chicago, Ill.

Continuation of application Ser. No. 560,322, June 24, 1966. This application Aug. 22, 1969, Ser. No. 852,330
Int. Cl. G05b *19/24*
U.S. Cl. 318—572 **11 Claims**

A numerical control system for machine tools or the like such as milling machines is disclosed which directs movement by absolute measurement from a reference zero. Programmed data relating to a desired absolute position of the reference zero is entered into a command register, the contents of which is compared bit by bit with data relating to the absolute actual position of the machine tool entered into a position register. The programmed dimension data relates to the actual size of the desired workpiece as provisions are made for entering data relating to tool size offset by means other than the program. A complete system is disclosed including the logic which synchronizes the input of the machine tool actual position with the command position data entered into the system from the programmer as well as the means for controlling the feed speed of the machine tool responsive to programmed data.



3,665,281

AUTOPILOT FOR SHIP

Yoichi Hirokawa, Kamakura-shi, Japan, assignor to Kabushiki Kaisha Tokyo Keiki Seizosho (Tokyo Keiki Seizosho Co., Ltd.), Tokyo, Japan

Filed Oct. 27, 1969, Ser. No. 869,546
Claims priority, application Japan, Nov. 1, 1968, 43/79723
Int. Cl. G05d *1/00*; B64c *13/18*
U.S. Cl. 318—588 **4 Claims**

An autopilot for a ship in which a course of a ship is calculated by a computer mounted in the ship and an output of the computer is supplied to the autopilot through a servo system to automatically steer the ship and having a gate circuit inserted between the servo system and the autopilot, the gate circuit being controlled by the output of the computer to thereby steer the ship automatically.

3,665,282

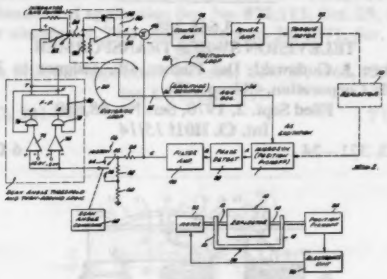
SCAN CONTROL SYSTEM

Bernard J. Skehan, Manhattan Beach, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed July 24, 1969, Ser. No. 846,302
Int. Cl. G05g *5/00*
U.S. Cl. 318—627 **13 Claims**

A system for accurately reciprocally driving a structural element, such as a flat reflector. The system includes a torque motor for driving the reflector, a position pick-off device for monitoring the position of the reflector, and an electronic unit comprising feedback paths coupling the pick-off device to the torque motor. The electronic unit includes a negative feedback positioning loop enclosed within an outer positive feedback hysteresis loop. The positioning loop comprises a type II (double integration) loop which yields a zero position error for a constant scan rate (angular velocity) input. The outer positive feedback loop functions to produce a precise triangular waveform (scan rate input) whose turn around points are precisely maintained in order to prevent

drift of the scan angle center point position. The system enables different scan angles (e.g., wide and narrow) to be



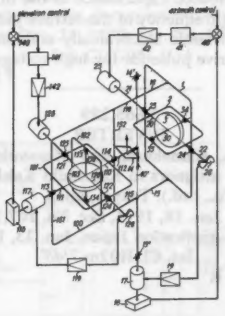
selected by varying scan frequency while maintaining scan rate constant.

3,665,283

PLURAL AXES GYRO-MOTOR LIGHT-BEAM TARGET TRACKING FACILITY

Jean Claude Le Gall, Rue des Bruyeres La Clante Ploumanach, Perros-Guirec, France

Filed June 18, 1970, Ser. No. 47,327
Claims priority, application France, June 20, 1969, 6920826
Int. Cl. B64c *17/06*
U.S. Cl. 318—649 **5 Claims**



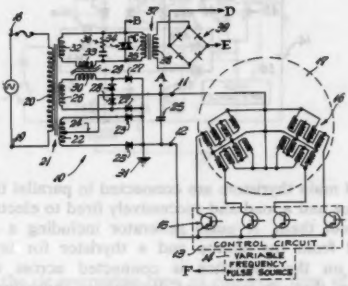
Light-beam target tracking facility comprising a stationary base, a source emitting a light beam lying on said base and an arrangement including two gyroscopes, a bearing gyroscope and an elevation gyroscope, used as motors and having intersecting and rectangular precession axes. Each gyroscope comprises a precession outer gimbal, a nutation inner gimbal, a rotor and a torque motor connected to its nutation inner gimbal. The precession outer gimbal of the bearing gyroscope bears a frame rigidly connected thereto and the precession outer gimbal of the elevation gyroscope is rotatable around said frame and bears a principal mirror rigidly connected thereto. The precession shaft of the bearing gyroscope is hollow and conveys the light beam. At the intersection of the precession axes of the two gyroscopes, another mirror deviates the light beam along the direction of the precession axis of the elevation gyroscope. Then the light beam falls on to the principal mirror which has a plane 45° apart from the plane of the precession outer gimbal of the elevation gyroscope and the beam is rejected perpendicularly to said outer gimbal plane.

3,665,284

POWER SUPPLY FOR A STEPPING MOTOR DEPENDENT UPON VOLTAGE LEVEL AND PULSING RATE

Robert J. Loyzim, Coventry, Conn., assignor to The Superior Electric Company, Bristol, Conn.

Filed July 20, 1970, Ser. No. 56,526
Int. Cl. H02k *37/00*
U.S. Cl. 318—696 **6 Claims**



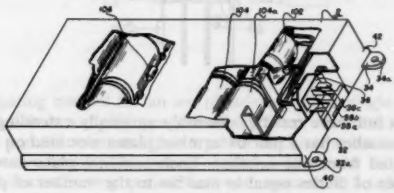
A power circuit for supplying power from an A.C. source to a D.C. energized variable speed stepping motor to increase the torque at high speeds and the maximum stepping speed of the motor with the speed of the motor being regulated by a control circuit to be independent of the voltage supplied thereto, by adjusting the value of the voltage from the A.C. source to the motor substantially inversely to the value of the current drawn by the motor during a relatively low range of speeds and by providing a substantially constant voltage of a higher value at high stepping speeds with the high constant voltage source being made operative from information that both the motor speed is above a predetermined value and the motor voltage exceeds a predetermined value.

3,665,285

POLARITY-MATED RECHARGEABLE BATTERY AND CHARGING UNIT

Ferdinand H. Mullersman, and Robert E. Rockey, both of Gainesville, Fla., assignors to General Electric Company

Filed May 27, 1970, Ser. No. 41,002
Int. Cl. H01m *45/04*
U.S. Cl. 320—2 **4 Claims**

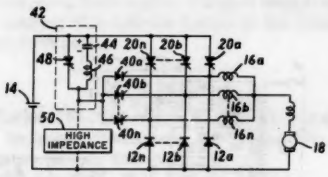


A novel charging system is disclosed wherein a battery pack and a battery charger are interconnected to provide predetermined desired charging rates to the cells in the battery pack. A plurality of means carried by the pack and the charger cooperate to allow insertion of the pack into the charger in only one way thus assuring proper polarity.

3,665,286
DIRECT CURRENT POWER CONTROL SYSTEM

Eiichi Ohno, and Masahiko Akamatsu, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 29, 1970, Ser. No. 76,442
Int. Cl. H02m 3/32
U.S. Cl. 321—2 11 Claims

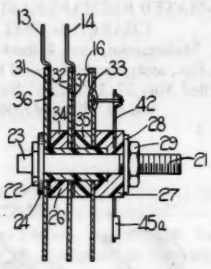


Plural main thyristors are connected in parallel between a dc source and a load and successively fired to electrically interconnect them. A pulse generator including a capacitor charged from the source and a thyristor for inverting a charge on the capacitor is connected across the main thyristors through individual distribution thyristors fired at predetermined time intervals to supply a discharge current from the capacitor to the associated main thyristors to render them nonconducting. After each discharge, the capacitor is again charged from the source and inverted in polarity. The power supply to the load is controlled by varying the starting times of the main thyristors.

3,665,287
FULL WAVE RECTIFIER ASSEMBLIES

Dennis Rowland Cross, Solihull, England, and Edward Stephens, Station B, Ottawa, Canada, assignors to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Mar. 25, 1970, Ser. No. 22,511
Claims priority, application Great Britain, Apr. 17, 1969, 19,578/69
Int. Cl. H02m 7/00
U.S. Cl. 321—8 R 4 Claims

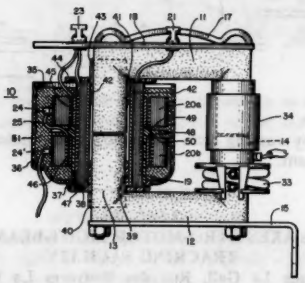


In a full wave rectifier assembly an axially extending support member has a pair of terminal plates mounted on it but insulated from one another. Each terminal plate carries a number of diodes equal in number to the number of phases of the supply to be rectified, with the diodes carried by one terminal plate having their cathodes electrically connected thereto and the diodes carried by the other plate have their anodes electrically connected thereto. In addition, a plurality of phase plates equal to the number of phases to be rectified are fixed relative to the support member and are insulated from one another and from the terminal plates, leads interconnecting the diodes and phase plates ensuring that the arrangement acts as a full wave rectifier. The phase plates are constructed from a single plate around which is moulded an insulating body used to support the phase plates relative to the support member, and the original plate is split to separate the phase plates from one another.

3,665,288
TELEVISION SWEEP TRANSFORMER

Theodore J. Godawski, Des Plaines, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Sept. 2, 1970, Ser. No. 68,830
Int. Cl. H01f 15/14
U.S. Cl. 321—24 6 Claims

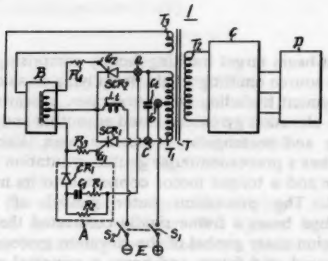


A harmonically tuned horizontal output transformer has the turns of the tertiary winding apportioned between two series connected winding sections in order to reduce its distributed capacitance and leakage inductance. These sections enclose the primary to establish a predetermined coupling therewith such that the leakage inductance of the tertiary resonates its distributed capacitance at the fifth harmonic of the characterizing frequency of the retrace pulse. The retrace pulse and the harmonic algebraically combine to provide a broadly peaked drive pulse for the high voltage rectifier.

3,665,289
INVERTER

Yoichi Hirokawa, Kamakura, and Masatoshi Sato, Tokyo, both of Japan, assignors to Kabushiki Kaisha Tokyo Keiki (Tokyo Keiki Co., Ltd.), Tokyo, Japan

Filed Jan. 18, 1971, Ser. No. 107,109
Claims priority, application Japan, Jan. 23, 1970, 45/7169
Int. Cl. H02m 7/48
U.S. Cl. 321—45 R 3 Claims



A parallel-connected type, self-commutation and self-controlled inverter employing two controlled rectifier elements, in which the connection point of one electrode of one of the controlled rectifier elements with the primary winding of a transformer of the inverter is connected to the gate of the other controlled rectifier element through a pulse generator circuit.

3,665,290

ELECTRONIC CONVERTER

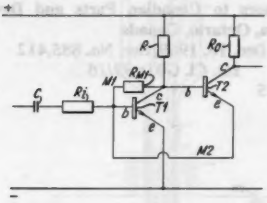
Benjamin Trok, Johanneshov, Sweden, assignor to International Standard Electric Corporation, New York, N.Y.

Continuation of application Ser. No. 872,113, Oct. 29, 1969, now abandoned. This application Apr. 28, 1971, Ser. No. 138,277

Claims priority, application Sweden, Nov. 15, 1968, 15,506/68

Int. Cl. H02m 7/20

U.S. Cl. 321—47 7 Claims



A circuit including an amplifier and a transistor for rectification including a feedback path to maintain the output voltage proportional to the input voltage. The amplifier also may include a feedback resistor to maintain the transistor at cutoff in the absence of an AC input signal.

3,665,291

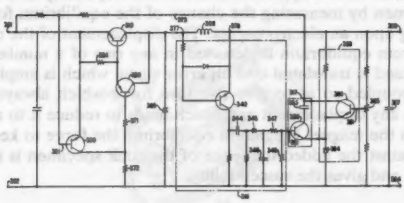
SELF-OSCILLATING CONSTANT FREQUENCY SWITCHING REGULATOR WITH PHASE CONTROL OF VOLTAGE REGULATION LOOP

Herbert Rudolf Weischedel, Rockaway, and George Raymond Westerman, Denville, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 21, 1970, Ser. No. 100,233

Int. Cl. G05f 1/56

U.S. Cl. 323—17 6 Claims



A self-oscillating switching mode regulator is frequency regulated by controlling the phase of the voltage control feedback signal. The phase lag of the feedback signal is controlled by a frequency regulation control loop. By continuously adjusting the phase lag of the feedback signal, the frequency of switching is maintained at a regulated value.

3,665,292

ELECTRIC SWITCHING CIRCUITS

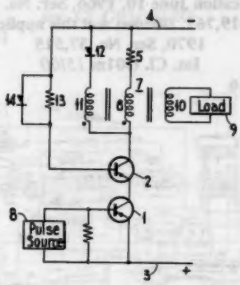
Adrian Francis Flynn, Fenstanton, England, assignor to The General Electric Company Limited, London, England

Filed Sept. 23, 1970, Ser. No. 74,610

Int. Cl. H01f 29/00

U.S. Cl. 323—48 2 Claims

In a transistor switching circuit in which a transistor is connected selectively to energize a load circuit including an inductive element, for example an output transformer, and in which a rectifier element is connected across the inductive element in the sense to conduct in response to reverse voltages induced when the transistor switches to its non-conducting condition, an auxiliary winding coupled to the inductive element is connected in series with the rectifier element in a sense such as to oppose the induced reverse voltages,



whereby the de-energizing time or recovery time of the inductive element is reduced.

3,665,293

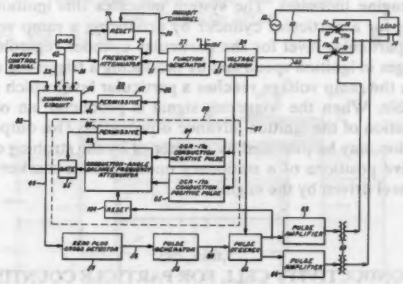
PHASE-CONTROLLED STATIC SWITCH FOR A POWER CIRCUIT HAVING A VARIABLE POWER FACTOR

Yoel Keiler, Philadelphia; Fred W. Kelley, Jr., Media, both of Pa., and Georges R. E. Lezan, Cherry Hill, N.J., assignors to General Electric Company

Filed Mar. 3, 1971, Ser. No. 120,509

Int. Cl. G05f 1/56

U.S. Cl. 323—24 14 Claims



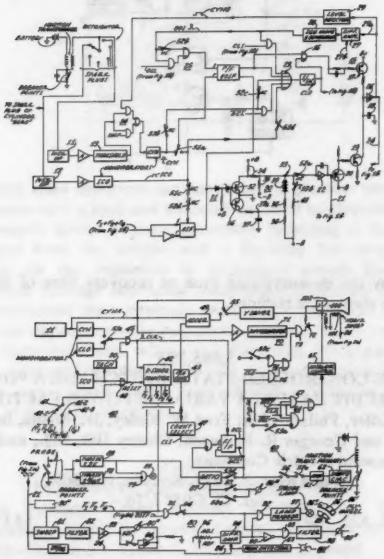
A gating control for an a-c phase-controlled, single-phase static switch comprising a pair of thyristors connected in inverse parallel relationship in a power circuit that has a variable power factor. The gating control controls the length of the non-conducting period between successive conduction periods of the switch in such a manner that the length of the non-conducting period is made approximately inversely proportional to an input control signal for the gating control, when the input control signal is between 0 and 1 per unit. A conduction-angle balancing circuit modifies the action of the gating control in such a manner that the conduction angles are forced toward a condition of equality despite a change therein produced by a change in the effective input control signal and despite the power circuit's having a low power factor.

3,665,294

SYSTEM FOR DETERMINING THE IGNITION ADVANCE IN THE DISTRIBUTION OF AN ENGINE

Edmond R. Pelta, Pacific Palisades, and Kenneth Stewart Gold, Canoga Park, both of Calif., assignors to Autoscan, Inc., Culver City, Calif.

Original application June 10, 1966, Ser. No. 556,710, now Patent No. 3,619,767. Divided and this application May 15, 1970, Ser. No. 37,515
Int. Cl. G01m 15/00
U.S. Cl. 324—16 14 Claims



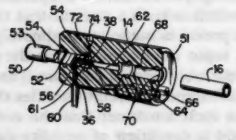
The invention relates to a system for indicating the ignition advance in the distributor of an engine where the speed of the engine increases. The system indicates this ignition advance for a particular cylinder by producing a ramp voltage to a particular level for the particular cylinder regardless of changes in ignition speed and by producing a triggering signal when the ramp voltage reaches a particular level which is adjustable. When the triggering signal is produced, an output indication of the ignition advance is provided. This output indication may be provided by a meter of by the strobing of the relative positions of a stationary marker and a marker on a flywheel driven by the engine.

3,665,295

CONDUCTIVITY CELL FOR PARTICLE COUNTING APPARATUS

Kurt Schoen, Zurich, Switzerland, assignor to Contraves AG, Zurich, Switzerland

Continuation of application Ser. No. 35,384, May 7, 1970. This application May 18, 1970, Ser. No. 38,039
Int. Cl. G01n 27/42, 27/00
U.S. Cl. 324—30 B 8 Claims



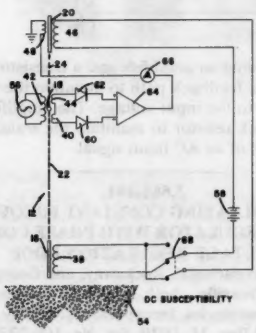
A conductivity cell for counting particles suspended in a liquid by detection of changes in the impedance of a fluid path caused by passage of particles through an aperture of the cell. The conductivity cell is provided with a pair of electrodes with an easily removable aperture disposed therebetween and a vent port adapted to permit purging of the cell after an analytic run.

3,665,296

SUSCEPTIBILITY METER FOR FIELD USE FOR DETERMINING SUSCEPTIBILITY OF A ROCK OUTCROP

Harry Gross, and David T. Symons, both of Ottawa, Ontario, Canada, assignors to Canadian Parts and Development Limited, Ottawa, Ontario, Canada

Filed Dec. 16, 1969, Ser. No. 885,412
Int. Cl. G01r 33/16
U.S. Cl. 324—34 S 2 Claims



A method and apparatus measures susceptibility of a rock specimen by measuring the change of the equilibrium forces acting upon an electromagnet. The displacement of the magnet from equilibrium is detected in any one of a number of ways and is translated into an error signal which is amplified and coupled so as to give rise to a force which always opposes any displacement and which tends to reduce it to zero. When the magnet is again in equilibrium the force to keep it so against the added influence of the rock specimen is measured and gives the susceptibility.

3,665,297

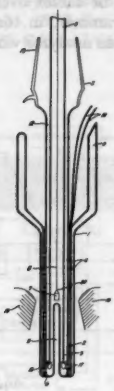
APPARATUS FOR DETERMINING MAGNETIC SUSCEPTIBILITY IN A CONTROLLED CHEMICAL AND THERMAL ENVIRONMENT

Kenneth P. Yates, Fullerton, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Mar. 4, 1970, Ser. No. 888,969
Int. Cl. G01r 33/12
U.S. Cl. 324—34 S 5 Claims

An apparatus for determining the static magnetic susceptibility of dia- and paramagnetic compositions in a controlled chemical and thermal environment comprises an elongate dewar flask containing a first inner tube sealably attached to the interior of the dewar flask at the lower end defining an annular volume between the first tube and the dewar flask, a second tube removably concentrically positioned within the said first tube defining an annular passage and being open at its lower end in communication with the annular passage, a sample container positioned within the second tube and suspended from a micro balance, means for heating and cooling the interior or the second tube and said sample and for

introducing and withdrawing fluids from the interior of the second tube and the annular passage between the first and



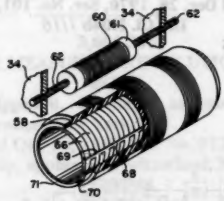
second tubes and a relatively high field density magnet positioned proximate the sample container.

3,665,298

METAL IMPURITY DETECTOR FOR TUBULAR CONVEYOR SYSTEM

Willard L. Geiger, Chagrin Falls, Ohio, assignor to Erico Products, Inc., Cleveland, Ohio

Filed Jan. 5, 1970, Ser. No. 764
Int. Cl. G01r *33/00*
U.S. Cl. 324—41 **4 Claims**



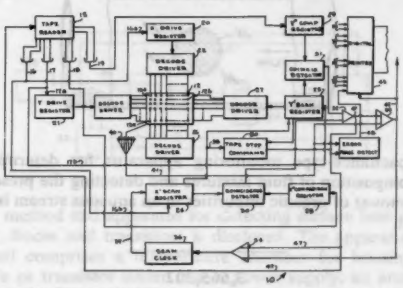
Apparatus for locating and removing foreign metal objects in the supply system of a plastic molding machine and the like wherein particulate plastic material is transported from a supply source at high velocity by way of a tubing system, consisting of a detector unit for monitoring the flow of the material through the tubing and a remote unit for momentarily diverting the flow when the presence of metal is detected. The diverter unit is a solenoid actuated flapper valve in the tubing system and the detector unit consists of a dual transmitter and receiver coil arrangement surrounding a part of the tubing, energized from a radio frequency energy source and arranged to develop an output signal when a transported metal object affects the normal balanced condition. Solid state components are employed throughout radio frequency oscillator, amplifier, differential detector and relay driver circuits and a balance coil and tuning slug are employed for critical adjustment of the signal balance and sensitivity in the sensing area.

3,665,299

TEST APPARATUS FOR DETERMINING CONTINUITY PATHS ON A MULTI-TERMINAL ARRANGEMENT

Kenneth A. Yarbrough, 1030 Medalist, Dallas, Tex.

Continuation of application Ser. No. 622,698, Aug. 23, 1967, now abandoned. This application Mar. 2, 1970, Ser. No. 14,796
Int. Cl. G01r *31/02*
U.S. Cl. 324—51 **9 Claims**



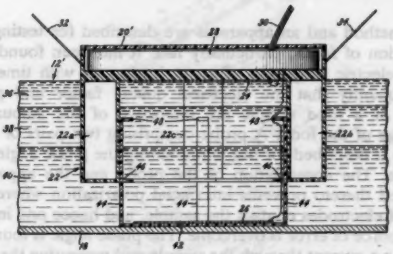
Test apparatus preferably comprising a signal forming means connected to a selected drive point which is one of the terminals, scanning apparatus for scanning the plurality of terminals, means for ascertaining electrical continuity between the driven point and each scanned point whereby continuity is either desired or undesired depending on the accuracy and faithfulness of wiring to the plurality of terminals, and output means identifying errors in test point wiring between the terminals.

3,665,300

LIQUID LAYER THICKNESS DEVICE HAVING A FLOATING ELECTRODE

Walter Edwin Sauer, Pottstown, and Vytautas Klemas, Berwyn, both of Pa., assignors to General Electric Company

Filed Mar. 5, 1971, Ser. No. 121,285
Int. Cl. G01n *27/26*
U.S. Cl. 324—61 R **8 Claims**



A device for measuring the thickness of a given immiscible liquid in a multi-liquid system wherein the other liquid or liquids in the system have a relatively higher dielectric constant than that of the given liquid. The device is comprised of a pair of substantially planar parallel electrodes which are mounted so that the upper electrode floats on the surface of the liquid system due to flotation means and the second electrode is positioned parallel thereto and at a level no higher than the lower-most level of the given liquid and means for measuring the capacitance between the pair of electrodes. The capacitance measured is therefore proportional to the thickness of the layer of the first liquid as the other liquids in the system are more highly conductive and therefore will not contribute significantly to the impedance (capacitance) measured.

3,665,301

CAPACITANCE-TYPE MONITORING APPARATUS

Frederick L. Maltby, Jenkintwon, Pa., assignor to Drexelbrook Controls, Inc., Glenside, Pa.

Filed Dec. 24, 1968, Ser. No. 786,663
Int. Cl. G01r 27/26
U.S. Cl. 324—61 P 6 Claims

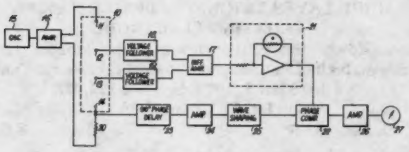
Capacitance-type monitoring apparatus for determining the composition of fluid mixtures and detecting the presence and amount of organic impurities in an aqueous stream is disclosed.

3,665,302

METHODS AND APPARATUS FOR DETERMINING THE CONDITION OF FOOD

Alexander Lees; John Charles Shenstone Richards, and Alfred Charles Jason, all of Aberdeen, Scotland, assignors to National Research Development Corporation, London, England

Filed Feb. 19, 1970, Ser. No. 12,568
Claims priority, application Great Britain, Feb. 24, 1969, 9,859/69
Int. Cl. G01r 1/06, 25/00, 27/02
U.S. Cl. 324—64 12 Claims



A method and an apparatus are described for testing the condition of foods, particularly fish. It has been found that the dielectric properties of some foods vary with time and consequently that the electrical quality factor and phase angle of a food sample are indicative of the amount of spoilage of the food. A probe comprising two pairs of electrodes is described for use in measuring the phase angle of a sample. The construction of the probe and the apparatus coupled thereto prevents interfacial polarization where one pair of electrodes contact the sample, and hence one important source of error is overcome. The phase angle is found by passing a current through the sample and measuring the relative phase of the current and of a potential sensed between the electrodes of the said pair.

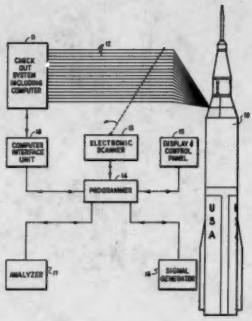
3,665,303

SYSTEM FOR AUTOMATICALLY AND MANUALLY TESTING LINES FOR DETERMINING IF INFORMATION CAN BE ACCURATELY TRANSMITTED THEREON

Leo O. Richards, 8344 Sylvan Drive, West Melbourne, Fla., and Walter E. Parsons, Route 1, Box 53 A, Kissimmee, Fla.

Filed Dec. 4, 1969, Ser. No. 882,123
Int. Cl. G01r 15/12, 31/00
U.S. Cl. 324—73 10 Claims

A hardline monitoring system for monitoring a plurality of lines over which signals are transmitted in order to determine if the characteristics of the lines are within certain predetermined tolerances. The monitoring system includes a programmer, an electronic scanner, an analyzer, a display and control panel, a signal generator, a computer interface unit, and a checkout computer. In operation, the electronic scanner, which is under the control of the programmer, scans a plurality of hardlines or cables over which the signals are transmitted. The programmer, in turn, couples these lines through the scanner to an analyzer which analyzes the signals



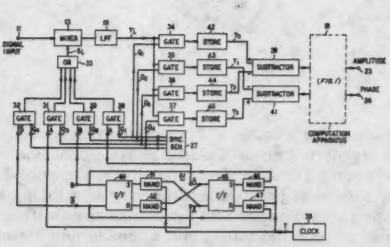
to determine if there is any distortion or deterioration of the line. If the signals being transmitted are out of tolerance, then the analyzer sends such information to a display and control panel to illuminate a lamp indicating such. Such information is also fed to a checkout computer through a computer interface unit and the programmer. A signal generator is provided for placing continuous data signals, FM signals and wordburst signals on the line when such is necessary.

3,665,304

SIGNAL AMPLITUDE AND PHASE HOMODYNE

Richard Lee Maybach, Holmdel, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 28, 1970, Ser. No. 101,813
Int. Cl. H04b 1/16
U.S. Cl. 324—85 19 Claims

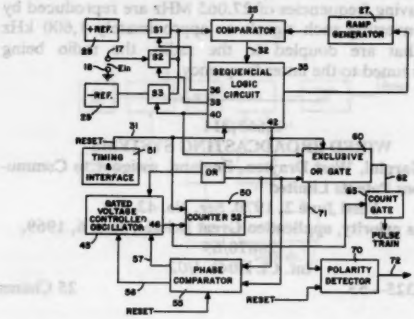


Homodyne signal detection apparatus which utilizes a unitary signal channel including a single mixer for processing an applied input signal with successively applied waveforms separated in phase by $\pi/2$ radians is disclosed. The product signals of each waveform and the input signal are filtered, stored, and selectively combined to develop signals which are sinusoidal or cosinusoidal functions of the phase angle of the applied signal and have magnitudes proportional to the amplitude of the input signal.

3,665,305
ANALOG TO DIGITAL CONVERTER WITH AUTOMATIC CALIBRATION

Harry G. Petrohilos, Yellow Springs, Ohio, assignor to United Systems Corporation, Dayton, Ohio

Filed Feb. 24, 1970, Ser. No. 13,621
Int. Cl. G01r 17/06, 1/02
U.S. Cl. 324—99 D 13 Claims

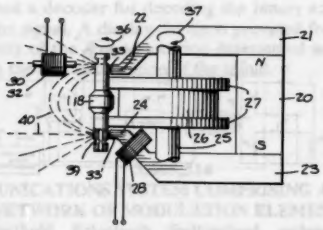


In a digital voltmeter, a single comparator circuit compares the output of a linear ramp generator with a first reference voltage, an unknown input voltage, and a second reference voltage to define a time ratio, which is independent of the slope of the ramp generator voltage, from which the magnitude of the unknown input voltage can be determined. A gate controlled oscillator generates a predetermined number of pulses in the reference time interval (i.e., the time interval between ramp voltage coincidence with the first and second reference voltages), and a feedback circuit is employed to maintain the number of pulses generated during this time interval constant regardless of any variations in the time interval. A smaller number of pulses representing the voltage ratio of unknown input voltage to the reference voltages is then applied to a conventional digital voltmeter display device.

3,665,306
PROCESS FOR MEASURING REVOLUTION SPEED OF A BODY

Peter Orth, Lippstadt, Germany, assignor to Herberlein Patent Corporation, New York, N.Y.

Filed Oct. 30, 1969, Ser. No. 872,491
Claims priority, application Switzerland, Nov. 18, 1968, 17200/68
Int. Cl. G01p 3/48
U.S. Cl. 324—174 2 Claims

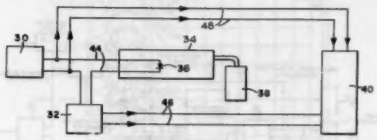


Process for measuring speed of revolution of a body in a magnetic field by forming the body to induce variations in the filed proportional to the speed of revolution of the body, inductively transferring such variations to a coil situated in the range of the magnetic field, and measuring the variations thus induced in the coil.

3,665,307
METHOD AND APPARATUS FOR DETECTING SURFACE IONS ON SILICON DIODES AND TRANSISTORS

Frank J. Cocca, East Boston, Mass., assignor to The United States of America as represented by the National Aeronautics and Space Administration

Filed June 5, 1970, Ser. No. 43,884
Int. Cl. G01r 31/22
U.S. Cl. 324—158 D 4 Claims

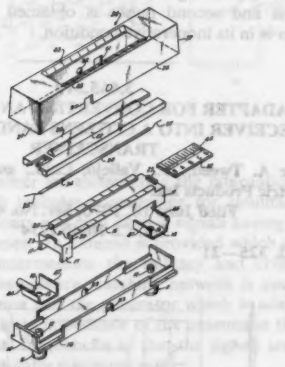


A method and apparatus for detecting surface ions on silicon diodes and transistors is disclosed. The apparatus disclosed comprises a temperature chamber for housing the diode or transistor under test, a power supply, an ammeter and an X-Y recorder. The semiconductor under test is subjected to various low temperatures and the reverse current-voltage characteristic curves of the semiconductor are plotted at each of the temperatures. From the reverse I-V characteristic curves, the presence of surface ions can be detected.

3,665,308
PACKAGE FOR AN ELECTROCHEMICAL ELAPSED TIME METER

Curtis C. Beusman, Mt. Kisco, N.Y., assignor to Curtis Instruments, Inc., New York, N.Y.

Filed May 28, 1970, Ser. No. 41,300
Int. Cl. G04f 9/00; G01r 1/04
U.S. Cl. 324—182 6 Claims

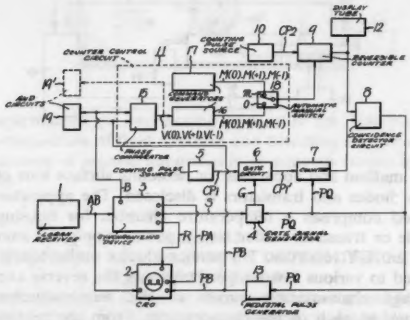


The electrochemical elapsed time meter package of the invention includes two parts which are separable from each other and which can be reassembled in reverse position. A coulometer tube and the magnifier therefor are mounted in mutual alignment and in inseparable and fixed relation to each other on one part of the package. The scale which cooperates with the coulometer tube is mounted on the other or second part of the package and is shiftable on its carrier so that its zero point can be reset with respect to the coulometer tube.

3,665,309
TIME INTERVAL MEASURING INSTRUMENT

Shosuke Sato, Tokyo; Shigeru Saito, Yokohama, and Saburo Kobayashi, Tokyo, all of Japan, assignors to Kabushiki Kaisha Tokyo Keiki Seizosho (Tokyo Keiki Seizosho Co., Ltd.), Tokyo, Japan

Filed May 6, 1970, Ser. No. 35,001
Claims priority, application Japan, May 14, 1969, 44/36691
Int. Cl. G04f 9/00, 11/06
U.S. Cl. 324—186 6 Claims

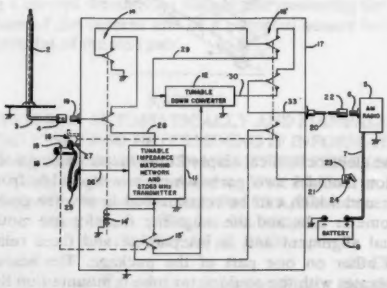


An instrument for measuring the time interval between first and second signals of the same period having a gate circuit for permitting the passage therethrough of a counting pulse controlled by a first pulse synchronized with the first signal in phase, a first counter for pulse derived from the gate circuit, a second counter capable of reversible counting another pulse, a detector circuit detecting agreement of the outputs of the first and second counter, means controlling the gate circuit to inhibit the passage therethrough of the pulse of the first counter based upon the output of the detector circuit, means producing a second pulse based upon the output of the detector circuit, and means stopping the operation of the second counter when the second pulse is in phase with the second signal, whereby the time interval between the first and second pulses is obtained when the second counter is in its inoperative condition.

3,665,310
ADAPTER FOR CONVERTING AN AM RADIO RECEIVER INTO A CITIZENS BAND CHANNEL 9 TRANSCEIVER

Horace A. Tweed, Jr., Vallejo, Calif., assignor to Sylvania Electric Products Inc.

Filed June 18, 1970, Ser. No. 47,428
Int. Cl. H04b 1/54
U.S. Cl. 325—21 2 Claims

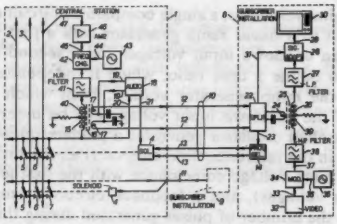


This adapter circuit comprises a microphone, a transmitter operating only at 27.065 MHz, and a down converter. It can be used with any conventional amplitude modulated (AM) radio set in an automobile without necessitating any physical change in the car radio. It is connected between the existing cable plug on the antenna and the antenna jack on the radio. During normal operation, signals received by the antenna are directly connected to the radio which is responsive only to signals having frequencies in the AM radio broadcast band. Emergency messages are transmitted at 27.065 MHz by actuating a switch that connects the antenna to the output of the transmitter, and talking into the microphone. Received signals having frequencies of 27.065 MHz are reproduced by down converting such signals to approximately 1,600 kHz signals that are coupled to the radio, the radio being manually tuned to the latter frequency.

3,665,311
WIRED BROADCASTING SYSTEMS

Eric J. Gargini, West Drayton, England, assignor to Communications Patents Limited

Filed June 2, 1970, Ser. No. 42,773
Claims priority, application Great Britain, June 6, 1969, 28870/69
Int. Cl. H04h 1/02
U.S. Cl. 325—53 25 Claims

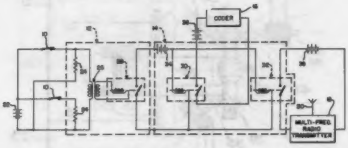


Wired broadcasting systems provide for originating programs at the subscriber station for transmissions over the same signal conductors for receiving programs. Central equipment makes the subscriber originated programs available for other subscribers.

3,665,312
RADIO ALARM SYSTEM

Michael Jarvis, Livingston, N.J., assignor to Paul Goldman, Livingston, N.J., a part interest

Filed Oct. 6, 1969, Ser. No. 864,077
Int. Cl. H04b 1/00
U.S. Cl. 325—54 9 Claims



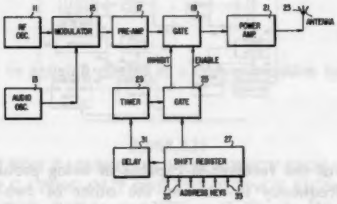
An alarm and monitoring system for a vehicle in which a transmitter is actuated upon illegal entry into or theft of the vehicle. The transmitter sends out a coded signal, which identifies the vehicle, sequentially on different frequencies with a predetermined and different time interval between each transmission. The received coded signals are used to located the vehicle by triangulation.

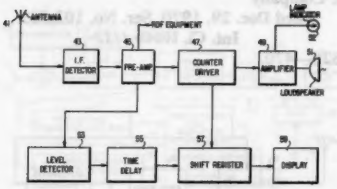
3,665,313

LOCATION IDENTIFICATION SYSTEM

Robert L. Trent, Marblehead, Mass., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed July 13, 1970, Ser. No. 54,270
Int. Cl. H04b 1/00
U.S. Cl. 325—55 26 Claims





This disclosure describes a location identification system for identifying a particular ground location from among a plurality of ground locations. Each ground location includes a transmitter that transmits a continuous tone signal when the transmitter is activated. Each transmitter also includes a binary encoder for encoding the continuous tone signal at spaced intervals. Each binary code uniquely identifies the particular transmitter with which it is associated. An aircraft flying above ground locations carries a receiver for receiving the continuous tone signal transmitted by an activated transmitter, and a decoder for decoding the binary encoded portion of the signal. A display device is provided for displaying the identity of the ground location determined as a result of decoding the encoded portion of the signal.

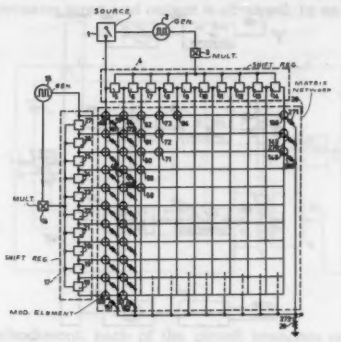
3,665,314

COMMUNICATIONS SYSTEM COMPRISING A MATRIX NETWORK OF MODULATION ELEMENTS

Peter Leuthold, Erlenbach, Switzerland, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 21, 1970, Ser. No. 65,968
Claims priority, application Switzerland, Aug. 21, 1969, 12694/69
Int. Cl. H04b 1/04
U.S. Cl. 325—141 20 Claims

In a transmission system a shift register controlled modulator matrix is employed to filter unwanted modulation products from the frequency band.

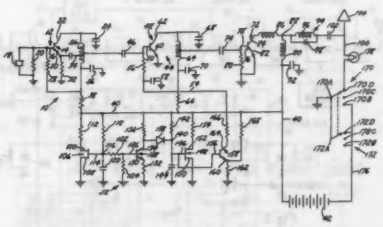


3,665,315

SIGNAL TRANSMITTER

Stephen G. Glatzer, 541 Pelham Road, New Rochelle, N.Y., and Rocco Scappatura, 102 Lawn Terrace, Mamaroneck, N.Y.

Filed Sept. 3, 1969, Ser. No. 854,882
Int. Cl. H04b 7/00
U.S. Cl. 325—178 11 Claims



A signal transmitter for transmitting the international distress signal which includes a generator for simultaneously producing the military and civil distress signals having the appropriate frequencies. An antenna is provided which is tuned to a frequency intermediate the military and civil signal frequencies. An impedance matching network is connected between the antenna and the generator which is adapted to produce the conjugate impedance of the antenna at the military and civil signal frequencies so that the signals are transmitted with substantially maximum power.

3,665,316

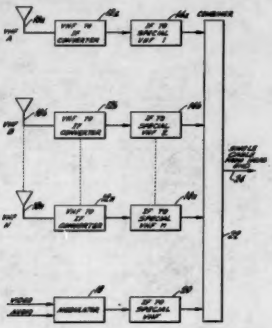
MAXIMUM CHANNEL UTILIZATION USING SINGLE ENDED AMPLIFIERS IN A FREQUENCY BAND GREATER THAN ONE OCTAVE

Michael F. Jeffers, Flourtown, Pa., assignor to Jerrold Electronics Corporation, Hatboro, Pa.

Filed July 6, 1970, Ser. No. 52,511
Int. Cl. H04b 1/06
U.S. Cl. 325—308 10 Claims

A CATV system is disclosed in which the channels are assigned so that all second order distortion components fall

within a sideband in a TV channel, such that the resulting interference is not perceptible to the eye. The channel assignment is selected by utilizing odd multiples of the sideband frequency as the video carrier for each channel.



3,665,317

SEQUENTIAL AGC SYSTEM FOR SIGNAL RECEIVER

Robert Palmer Crow, Los Angeles, Calif., assignor to RCA Corporation

Filed Apr. 7, 1970, Ser. No. 26,372
Int. Cl. H04b 1/28
U.S. Cl. 325—319 **9 Claims**

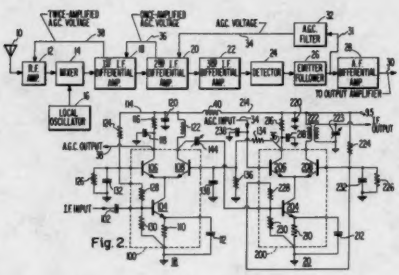


Fig. 2.

The use of one or more differential amplifiers in a cascaded carrier-frequency (IF and/or RF) amplifier for performing signal amplification in the forward direction of the cascaded amplifier, while simultaneously performing DC amplification of an AGC voltage derived from the output of the detector stage of the receiver in the backward direction of the cascaded amplifier.

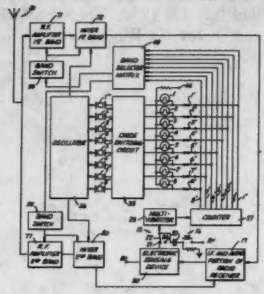
3,665,318

RADIO RECEIVER

Stephen J. Hoffman, Indianapolis, and Louis E. Schonegg, Brownsburg, both of Ind., assignors to Regency Electronics, Inc., Indianapolis, Ind.

Filed Mar. 18, 1970, Ser. No. 20,669
Int. Cl. H04b 1/32
U.S. Cl. 325—470 **8 Claims**

An FM monitor type radio having indicator lights on its front face to indicate the particular channel to which the receiver is tuned. A digital counter driven by a multivibrator cycles the radio in order, through its various channels. The multivibrator is switchable from a free running state to a state in which it is actuated to drive the counter one position by means of a manual selector switch. The number of channels to which the radio tunes can be controlled by opening or closing one or more of a plurality of switches each of which is provided for a respective one of the channels. Each of the channels of the receiver is capable of being pretuned to a desired frequency in one or the other of two separate frequency bands.

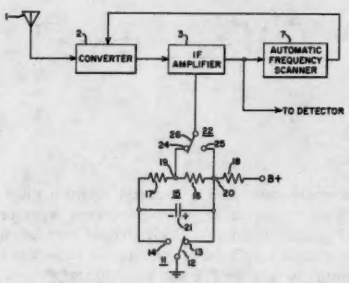


3,665,319

STATION DISENGAGEMENT AND SENSITIVITY CIRCUIT FOR SCAN TUNED RADIO RECEIVERS

Joseph A. Worcester, Frankfort, N.Y., assignor to General Electric Company

Filed Dec. 29, 1970, Ser. No. 102,305
Int. Cl. H04b 1/32
U.S. Cl. 325—470 **8 Claims**



Upon scan initiation, a voltage is supplied to an amplifier of a scan tuned radio receiver to drive it into saturation and remove an input from the receiver's automatic frequency scan system, causing it to disengage from a previously tuned station. The source of said voltage also charges a control capacitor that, upon having the reference connection thereto reversed, selectively provides a voltage of opposite polarity to that originally supplied for reducing the sensitivity of the amplifier during the duration of the scan. Shortly after a station is encountered, full sensitivity is restored when the capacitor discharges.

3,665,320

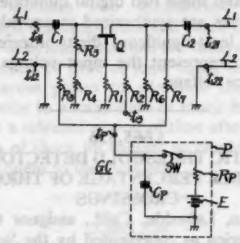
GATE CIRCUIT

Mitsuo Ohsawa, Fujisawa, and Shinziro Mino, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed July 7, 1970, Ser. No. 52,954
Claims priority, application Japan, July 11, 1969, 44/55240
Int. Cl. H04b 1/16
U.S. Cl. 325—478 **7 Claims**

A gate circuit utilizing a field effect transistor which has

very rapid turn-off and turn-on time so that it may be used as



a muting or squelch circuit in a communication system, for example.

3,665,321

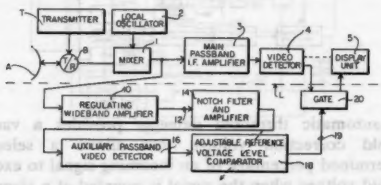
SYSTEM FOR PASSING ON-FREQUENCY SIGNALS AND FOR GATING-OUT OFF-FREQUENCY SIGNALS

Lewis Michnik, Buffalo, and William G. Tapply, West Seneca, both of N.Y., assignors to Sierra Research Corporation

Continuation-in-part of application Ser. No. 603,865, Dec. 22, 1966, now abandoned. This application July 2, 1969, Ser. No. 842,799

Int. Cl. H04b 1/10

U.S. Cl. 325—478 **15 Claims**



A system for accepting signals of a desired frequency as well as undesired signals of other frequencies together therewith, examining the desired and undesired frequency components with regard to their intensities and using the results thereof to control gating means in the main receiver output path to pass signals whenever the relative levels of desired and undesired signal components fall within a satisfactory range. This determination is made by regulating a composite of both signal components to a constant level, and then comparing the level of a selected one of these components of the regulated composite with a preadjusted reference threshold level to derive a gate control signal.

3,665,322

PRECISION CONVERTER/AMPLIFIER UTILIZING A COMPARATOR NETWORK AND A PAIR OF INTERNAL SIGNAL SOURCES

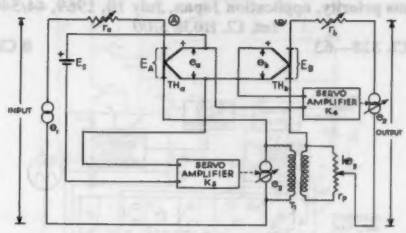
Loebe Julie, New York, N.Y., assignor to Julie Research Laboratories, Inc., New York, N.Y.

Continuation of application Ser. No. 627,846, Apr. 3, 1967, now abandoned. This application June 17, 1970, Ser. No. 47,144

Int. Cl. G06g 7/20

U.S. Cl. 328—3 **17 Claims**

A precision converter or power amplifier of electrical signals comprised of a comparator bridge having a pair of isolated circuit branches matched for a particular voltage level. An input signal *a* is applied to one branch, a second signal *b* after amplification or attenuation by a factor *k* is applied to the other branch, and a third signal *c* is coupled to both branches so as to add either in linear or in rms fashion to each of the signals *a* and *b* respectively. The amplitudes of the two signals *b* and *c* are adjusted so that, for any value of input signal *a*, the matched operating level is restored across both branches, whereupon $ka = b$ and the desired signal conversion between input and output is obtained. In an rms converter embodiment, each of the circuit branches contains a power-sensitive element (e.g., a thermistor or thermocouple), the third signal *c* has a waveform which is non-coherent with the waveforms of both *a* and *b*, and the respective signals add in rms fashion so that ka rms $= b$ rms.



3,665,323

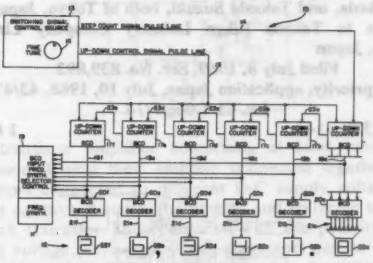
PROPORTIONAL DIGITAL CONTROL FOR RADIO FREQUENCY SYNTHESIZERS

Max E. Peterson, Richardson, Tex., assignor to Collins Radio Company, Dallas, Tex.

Filed May 10, 1971, Ser. No. 141,895

Int. Cl. H03b 19/00

U.S. Cl. 328—14 **12 Claims**

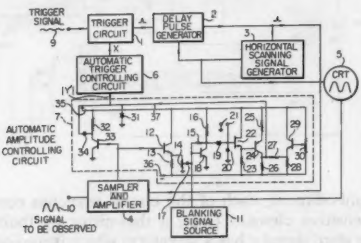


A proportional digital control system for radio frequency synthesizers using binary coded decimal control to a frequency synthesizer tunable in contiguous small interval increasing or decreasing steps throughout the frequency bandwidth range of operation. A fine tune dial switch circuit generates a two signal output with one a step count signal and the other an up-down control signal generated only upon rotation of the fine tuning dial and with the signal pulse rates thereof a direct function of the rate of fine tune dial turning. The up-down control signal is an up or down signal input to up-down pulse counting to BCD output circuits as determined by phase relation thereof to the step count signal and with the phase determined by direction of fine tune dial turning clockwise for up count and counterclockwise for down count. The up-down counters to BCD are in a chain circuit with carry over circuitry for up-down count transition from one digit location to another that in some equipments is paralleled by supplemental band switching circuits. The BCD outputs of the up-down counter chain circuits are applied to a frequency synthesizer circuit and to readout display device circuits.

3,665,324
TRIGGER CONTROLLING METHOD

Naohisa Nakaya, Tokyo, Japan, assignor to Iwatsu Electric Co., Ltd., Tokyo, Japan

Filed June 12, 1970, Ser. No. 45,795
Claims priority, application Japan, July 10, 1969, 44/54079
Int. Cl. H03k 5/00
U.S. Cl. 328—63 **8 Claims**

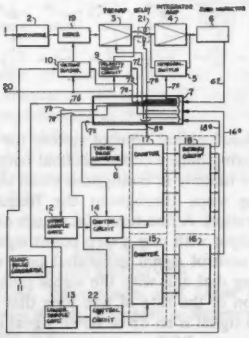


An improved trigger controlling method of the present invention uses a memory circuit for storing a signal which is proportional to the differentiated waveform of a sampled observing signal, and the differentiated waveform is controlled by the signal stored in the memory circuit. As a result of this, the improved method of the present invention provides a trigger signal which is obtained automatically and in a stable condition, an output pulse synchronized with an input observing signal for all magnitudes of the input observing signal which is to be applied to a sampling device such as a sampling oscilloscope.

3,665,325
VOLTAGE COMPARATOR

Ikuo Takeda, and Takashi Suzuki, both of Tokyo, Japan, assignors to Takeda Riken Industry Company Limited, Tokyo, Japan

Filed July 8, 1969, Ser. No. 839,892
Claims priority, application Japan, July 10, 1968, 43/47789
Int. Cl. G06g 7/14
U.S. Cl. 328—146 **1 Claim**

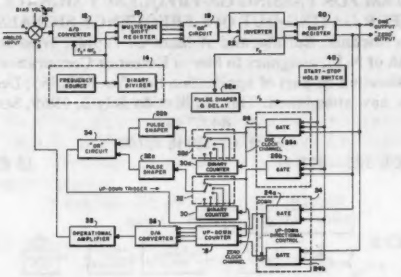


This invention relates to a voltage comparator of a high resolving power and high accuracy wherein an input voltage and a reference voltage are respectively integrated to indicate as a digital quantity the ratio of times required for the integrated values to become proper equal values, an analog value corresponding with this digital quantity is an then multiplied by the reference voltage to obtain an analog error voltage, the difference between said error voltage and the reference voltage is amplified by a scaling factor, and said amplified error voltage is again integrated against a reference voltage to obtain a second ratio of times represented by a digital quantity and these two digital quantities representing said ratios of times are synthesized to provide most-significant digits and least-significant digits interrelated by said scaling factor to represent the input voltage as compared with the reference voltage.

3,665,326
AUTOMATIC THRESHOLD DETECTOR WITH SELECTABLE PERCENTAGE OF THRESHOLD CROSSINGS

Dean R. Sullivan, Lakeside, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed Mar. 30, 1970, Ser. No. 24,015
Int. Cl. H03b 3/02
U.S. Cl. 328—151 **5 Claims**

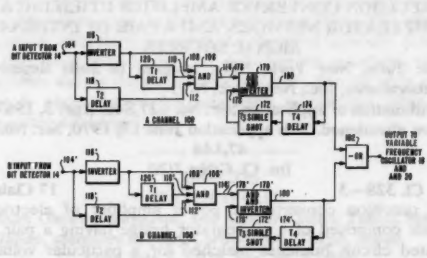


An automatic threshold detector provides a variable-threshold correction voltage that allows a selectively predetermined percentage of an incoming signal to exceed a threshold voltage when the signal is sampled at a given rate. The detector generates a logic "one" for each crossing and a "zero" for each non-crossing of the threshold. The "one" and "zero" counts are then converted by digital techniques into a feedback correction voltage to maintain the selectively predetermined percentage of "ones" at the output.

3,665,327
NOISE DISCRIMINATOR FOR DIGITAL DATA DETECTION SYSTEM

Peter I. Prentky, Los Gatos, and Alonzo A. Wilson, San Jose, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 14, 1969, Ser. No. 876,948
Int. Cl. H03k 5/12
U.S. Cl. 328—163 **15 Claims**



In a digital data detection system in which a readout signal derived from a magnetic recording of the data in encoded form is differentiated to identify the various data and clock bits represented by the peaks thereof, a discriminator is pro-

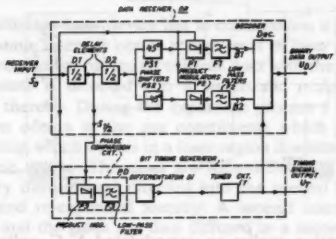
vided for eliminating shoulder noise pulses from the differentiated signal prior to the separation of the various zero-crossings thereof into "ones" and "zeros" at the output. The discriminator includes two symmetrical complementary channels through which the data and clock bits are alternately passed. The data and clock bits are delayed at the channel inputs for a period of time at least equal to the duration of the shoulder noise pulses to eliminate those noise pulses which occur prior to a valid date or clock bit. Each channel is inhibited for a selected period of time after the occurrence of a valid data of clock bit therein to eliminate noise pulses occuring subsequent to the valid bits.

3,665,328

SYNCHRONIZING SIGNAL GENERATOR FOR USE WITH A DIFFERENTIALLY MULTIPHASE MODULATED SIGNAL RECEIVER

Walter Herbert Erwin Widl, Bandhagen, Sweden, assignor to Telefonaktiebolaget LM Ericson, Stockholm, Sweden

Filed June 24, 1970, Ser. No. 49,255
Claims priority, application Sweden, July 2, 1969, 9381/69
Int. Cl. H03d *3/02*
U.S. Cl. 329—110 **3 Claims**



In data receivers used for receiving and demodulating a differentially multiphase modulated signal, i.e. a signal in which the phase position is changed with definite intervals wherein the magnitude of the phase change determines the information contents of the signal received, there is included an arrangement for producing a control signal upon the occurrence of such phase changes. The arrangement includes a phase comparison circuit having one input supplied by the input of the receiver and another input connected to the output of a delay circuit connected to the receiver input. The delay of said delay circuit is approximately equal to half of the interval in which the phase position is changed. The output signal value of the phase comparison circuit is changed at the beginning of each interval and the control signal is obtained from a differentiating circuit connected to the output of the phase comparison circuit.

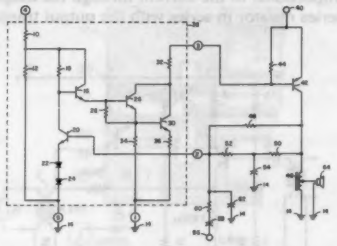
3,665,329

AUDIO FREQUENCY AMPLIFIER

William F. Davis, Tempe, and Thomas M. Frederiksen, Scottsdale, both of Ariz., assignors to Motorola, Inc., Franklin Park, Ill.

Filed Dec. 23, 1969, Ser. No. 887,531
Int. Cl. H03f *3/42, 3/04*
U.S. Cl. 330—19 **11 Claims**

An amplifier is provided to be used as a driver for a class A power transistor amplifier particularly adapted to be operated in the audio frequency range. The performance of the complete audio system is characterized by high openloop gain and minimized phase shift around the closed feedback loop. This allows excellent frequency performance with low distortion over the entire audio range at power levels greater than one watt. The driver portion of the amplifier allows the overall performance of the audio system to be independent of B variations of the power transistor and B variations of the



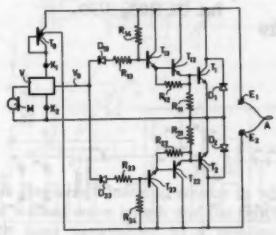
transistors used in the driver itself. The driver portion can easily be fabricated as an integrated circuit if desired.

3,665,330

TRANSISTOR AMPLIFIER INSENSITIVE TO THE POLARITY OF THE SUPPLY VOLTAGE

Poothathamby Tharmaratnam, Nijmegen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed July 10, 1970, Ser. No. 53,940
Claims priority, application Netherlands, Nov. 11, 1969, 6916988; May 20, 1970, 7007313
Int. Cl. H23f *3/10*
U.S. Cl. 330—24 **3 Claims**



A transistor amplifier comprising at least two output transistors having their emitters connected together, their collectors connected to different D-C supply voltages and diodes connected across the emitter and collector terminals of each transistor. In accordance with the polarity of the supply voltage, either one of the transistors can be made to cooperate with the diode across the other transistor that is not operating thereby resulting in amplification of an input signal independent of the polarity of the supply voltage. The circuit is suitable for use in integrated circuits.

3,665,331

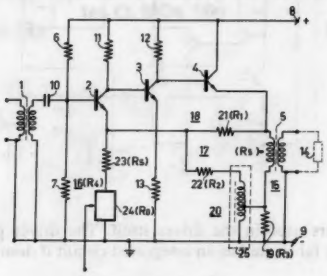
DEVICE COMPRISING A TRANSISTOR AMPLIFIER HAVING AN INPUT AMPLIFYING STAGE AND AN OUTPUT AMPLIFYING STAGE

Robartus Pieter Wiarda, and Willem Van Dorn, both of Hilversum, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of application Ser. No. 770,189, Oct. 24, 1968. This application Apr. 3, 1970, Ser. No. 22,143
Claims priority, application Netherlands, Nov. 6, 1967, 6715086
Int. Cl. H03f *1/34*
U.S. Cl. 330—28 **2 Claims**

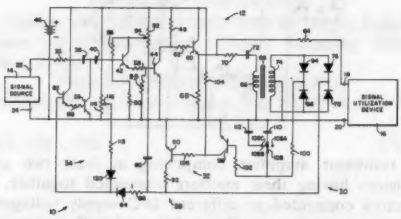
The invention relates to a device comprising a transistor amplifier having an input amplifying stage an output amplifying stage and an output circuit including an output transformer transistor amplifier has a combined voltage and current negative feedback. The output circuit of the output amplifying stage is coupled with the emitter circuit of the input

amplifying stage through a coupling network in which the voltage of the output circuit is applied through a voltage coupling circuit for the negative voltage feedback and the voltage proportional to the current through the output circuit across a series resistor in series with the output transformer is



applied through a current coupling circuit for the negative current feedback to the emitter circuit. The negative current feedback circuit includes furthermore an adjustable control-resistor for controlling the amplification factor of the transistor amplifier.

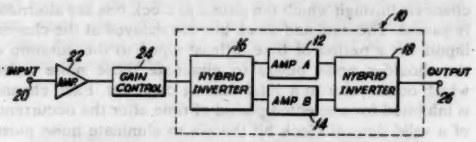
3,665,332
AVC SYSTEM
Richard H. Campbell, Rockford, Ill., assignor to Webster Electric Company, Inc., Racine, Wis.
Filed Apr. 20, 1970, Ser. No. 30,111
Int. Cl. H03g *3/30*
U.S. Cl. 330—29 **11 Claims**



An audio amplifier is provided with an automatic volume control system including an unpolarized junction transistor coupled in shunt with the amplifier input terminals and serving as a bidirectional variable resistance shunt having a resistance level controlled in accordance with an AVC operating signal appearing upon a capacitor charged by a detecting circuit in accordance with the amplifier output signal amplitude. Release time of the AVC system is determined by a variable resistance device connected in a capacitor discharge path, and the device is controlled to have decreasing resistance as amplifier output signals decrease. Sensitivity of the amplifier is controlled by an adjustable circuit providing a residual, nonvarying signal component to the control electrode of the unpolarized transistor to establish a maximum resistance level.

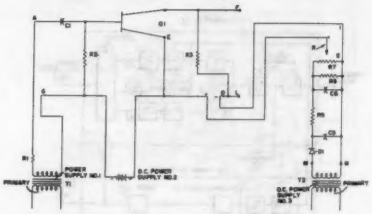
3,665,333
PUSH-PULL AMPLIFIER
Henry Yastrov, Langhorne, Pa., assignor to Jerrold Electronics Corporation, Hatboro, Pa.
Filed May 5, 1970, Ser. No. 34,704
Int. Cl. H03f *3/60*; H03l *3/28*
U.S. Cl. 330—53 **5 Claims**

In an improved push-pull amplifier, the input and output phase inverters each include 3db hybrid splitters with a 180° phase shift transformer in one output leg and a 0° phase shift transformer in the other leg. Each phase inverter is separate-



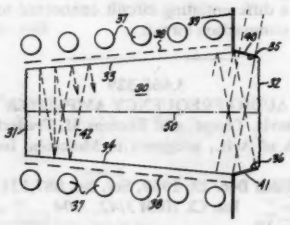
ly mounted on a plug-in circuit board having provisions for releasable connection with the inputs and outputs of the amplifier sections.

3,665,334
BIAS VOLTAGE SUPPLY
Lloyd D. DeCoster, 63 Wall Street, Bridgewater, Mass.
Filed May 12, 1969, Ser. No. 825,127
Int. Cl. H03f *3/04*
U.S. Cl. 330—40 **1 Claim**



My invention applies an unmodulated A. C. voltage, having the form of a sine-wave, and derived from standard household electricity, commonly known as line voltage, to the input of a standard transistor configuration, namely that of the grounded-emitter configuration, which amplifies both voltage and current.

3,665,335
COOLABLE SLAB LASER
Kiyo Tomiyasu, Paoli, Pa., assignor to General Electric Company
Filed Jan. 26, 1970, Ser. No. 5,595
Int. Cl. H01s *3/06*
U.S. Cl. 331—94.5 **6 Claims**



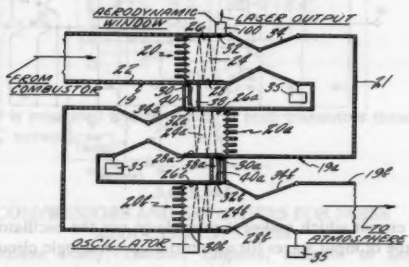
A coolable slab laser is disclosed wherein the effects of thermal gradients within the laser element are minimized. The laser beam is made to traverse the longitudinal axis of the laser element a plurality of times in a zig-zag fashion so as to travel parallel to the thermal gradient as closely as possible. The laser element itself is an eight sided solid with beam entrance and exit areas on the same end of the element.

3,665,336

LASER DEVICE

George H. McLafferty, Manchester, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed May 23, 1968, Ser. No. 731,659
Int. Cl. H01s 3/05, 3/09
U.S. Cl. 331—94.5 6 Claims



A multistage laser device has in combination a plurality of gas dynamic lasers to obtain a high level of laser power output. A combustor having an exhaust duct with the proper gas constituents is directed into a supersonic nozzle and expanded thereby. During the expansion process a population inversion occurs in the gas constituents which provides a laser action which occurs in a laser region downstream of the expansion nozzle. The gases are then diffused in a variable geometry diffuser and directed into the second supersonic nozzle and re-expanded thereby. A second laser region is formed and the gases are then diffused in a second variable geometry diffuser. This diffuser directs this flow into a third supersonic nozzle and expands it again. A third laser region is formed and the gases are diffused again in a third variable geometry diffuser and directed into the atmosphere or to a turbine for obtaining shaft power necessary for pumps or compressors. The gas dynamic lasers are positioned so that an oscillator can direct a beam into the lasing region of one gas laser through an opening and have it amplified by action therein between two reflecting surfaces and then directed to the exterior of the region through an opening and passed through an interconnecting optical cavity where it is redirected to the lasing region of a second gas laser. The beam is re-amplified by the two reflective surfaces in this region and directed to a second interconnecting optical cavity where the beam is then redirected into the third lasing region of another gas laser. The beam is re-amplified by the reflective surfaces in this third region and directed as a laser output beam through an aerodynamic window. While the gas lasers shown are of the expansion type, it is probably desirable to employ a supersonic-mixing gas dynamic laser configuration for the first unit downstream of the combustor. This is because the supersonic-mixing laser avoids many of the losses associated with rapid kinetic rates at high pressures.

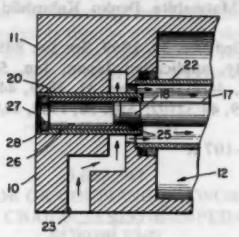
3,665,337

METHOD AND MEANS FOR SEALING LASER RODS

Walter Koechner, Malibu, Calif., assignor to Union Carbide Corporation, New York, N.Y.

Filed July 17, 1970, Ser. No. 55,891
Int. Cl. H01s 3/00
U.S. Cl. 331—94.5 4 Claims

A metallic film in the form of a band is provided about each end of a laser rod. These metal bands in conjunction with a specially desiged rod holder enable conventional elastomer type O-rings to be used to seal the rod in the laser head cavity. Heretofore, such O-rings could not be used because of deterioration resulting from the high intensity pump radiation within the cavity. By means of the metal



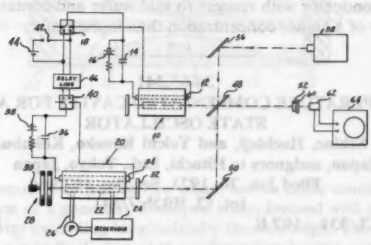
bands and holder, the O-rings are shielded from such radiation.

3,665,338

VARIABLE FREQUENCY INFRA RED SOURCE

Robert B. Harris, and John A. MacDonald, both of Cherry Hill, N.J., assignors to Synergetics Research, Inc., Sea Girt, N.Y.

Filed Oct. 28, 1969, Ser. No. 871,885
Int. Cl. H01s 3/00
U.S. Cl. 331—94.5 6 Claims



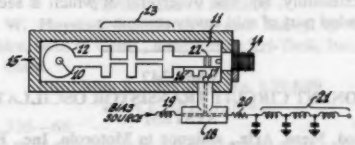
A variable frequency infrared source in which the output of a laser of a fixed wave length and the output of a variable wave length laser are mixed in a nonlinear medium to produce an output containing a separable component in the infrared region, the frequency of which can be varied over substantially the entire infrared spectrum by varying the wave length of the variable laser.

3,665,339

SELF-PULSED MICROWAVE OSCILLATOR

Shing-Gong Liu, Princeton, N.J., assignor to The United States of America as represented by the United States Atomic Energy Commission

Filed Sept. 25, 1970, Ser. No. 75,416
Int. Cl. H03b 7/14
U.S. Cl. 331—107 R 10 Claims



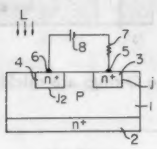
A pulse forming network, comprising a delay device and a matching resistor, is used to control the bias signal necessary for activating a negative resistance semiconductor device into microwave oscillations. The delay device is designed to control the duration of microwave oscillation and the matching resistor controls the period between output pulses.

3,665,340

PHOTOSENSITIVE SOLID OSCILLATOR

Kiyoshi Kojima, and Toshiro Abe, both of Osaka, Japan, assignors to Matsushita Denko Kabushiki Kaisha, Osaka, Japan

Filed Dec. 30, 1969, Ser. No. 889,236
Claims priority, application Japan, Jan. 5, 1969, 44/1264; Feb. 14, 1969, 44/11180; Mar. 31, 1969, 44/25113; Apr. 24, 1969, 44/32102; Apr. 30, 1969, 44/33831
Int. Cl. H03b 7/06
U.S. Cl. 331—107 R 4 Claims



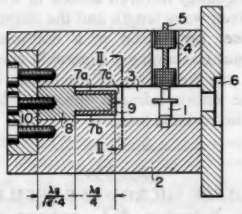
A photosensitive solid oscillator, which comprises an impurity layer formed on a surface of a semi-conductor wafer, two separate impurity layers formed on the other surface of said wafer as spaced along the surface from each other, and electrodes respectively provided at least on each of the latter two impurity layers. The respective impurity layers on both surfaces of the wafer are of a reversely conducting type semiconductor with respect to said wafer and contain an impurity of a higher concentration than in the wafer.

3,665,341

TEMPERATURE COMPENSATED CAVITY FOR A SOLID STATE OSCILLATOR

Kenji Sekine, Hachioji, and Yoichi Kaneko, Kokubunji, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 20, 1971, Ser. No. 107,944
Int. Cl. H03b 7/14
U.S. Cl. 331—107 R 8 Claims



A temperature compensated cavity for a solid state oscillator in which part of the conductive plates forming the cavity resonator is constituted by a movable plate, said movable plate being secured to one end of a dielectric rod having a large coefficient of linear expansion, the end of which is supported extensibly, and the other end of which is secured to the extended part of said cavity resonator.

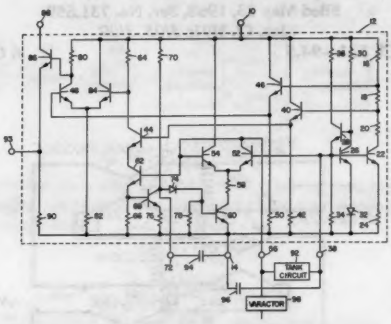
3,665,342

RESONANT CIRCUIT TRANSISTOR OSCILLATOR SYSTEM

L. J. Reed, Mesa, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Nov. 4, 1970, Ser. No. 86,685
Int. Cl. H03b 3/02, 5/12
U.S. Cl. 331—109 8 Claims

An oscillator including a bias source which may be applied to a chip by integrated circuit techniques is disclosed. The oscillator has a tank circuit for determining frequency and has an automatic gain control for keeping the amplitude of the oscillator output constant. The oscillator includes an output circuit which makes it possible to use the oscillator as a source of input waves for an emitter coupled logic circuit.

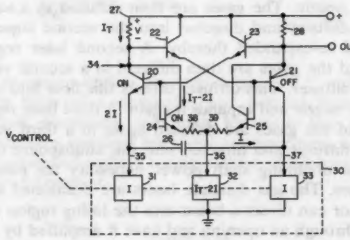


3,665,343

VOLTAGE CONTROLLED MULTIVIBRATOR

James Elbert Thompson, Scottsdale, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Nov. 9, 1970, Ser. No. 87,909
Int. Cl. H03k 3/282
U.S. Cl. 331—113 R 5 Claims



A voltage controlled multivibrator having an output frequency which is a linear function of a control voltage over the entire operating range of the device is disclosed in which the output frequency is a linear function of the current drawn by the multivibrator circuit. The multivibrator includes a variable current source to regulate its output frequency in which current through the variable current source is a linear function of the control voltage.

3,665,344

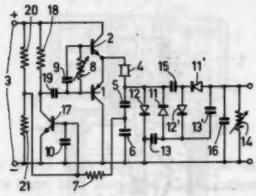
SELF-OSCILLATING VOLTAGE CONVERTER

Engel Roza; Herman J. G. M. Benning, and Anthonius J. J. C. L. Lommers, all of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 22, 1969, Ser. No. 852,398
Claims priority, application Netherlands, Aug. 22, 1968, 6812023
Int. Cl. H03b 5/36
U.S. Cl. 331—116 R 6 Claims

A self-oscillating voltage converter including a pair of complementary transistors connected in single-ended push-pull configuration without the use of a transformer. The first transistor is shunted by a piezo-electric two-terminal device

in series with a relatively large capacitor, across which an output alternating voltage at the resonant frequency of the



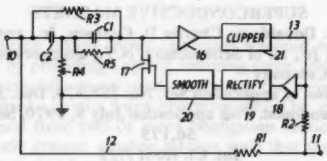
device is produced and fed back to both transistors through an R-C network.

3,665,345

COMPRESSORS AND EXPANDERS FOR NOISE REDUCTION SYSTEMS

Ray Milton Dolby, London, England, assignor to Dolby Laboratories Inc., New York, N.Y.

Filed July 15, 1970, Ser. No. 55,201
Claims priority, application Great Britain, July 21, 1969, 36,466/69
Int. Cl. H04b *1/64;* **H03h** *7/10;* **H03g** *5/16*
U.S. Cl. 333—14 **10 Claims**



The invention concerns noise reduction systems and compressors and expanders therefor in which the overall characteristic is formed by combining the output of a further path additively or subtractively with the output of a main, straight-through path, the further path including a filter and limiter.

In this improvement the filter is essentially all-pass at low levels and only becomes high- pass or low-pass at higher levels. At low levels noise reduction is therefore wide-band.

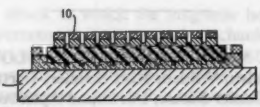
Applicable to tape and disc audio noise reduction.

3,665,346

THIN FILM DISTRIBUTED RC STRUCTURE

William H. Orr, Allentown, Pa., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Original application Sept. 16, 1966, Ser. No. 579,953, now Patent No. 3,542,654. Divided and this application Oct. 16, 1969, Ser. No. 871,200
Int. Cl. H03h *7/10;* **H05k** *1/16*
U.S. Cl. 333—70 CR **3 Claims**



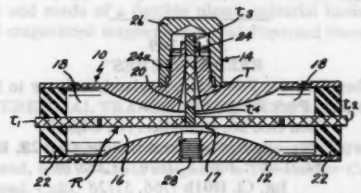
This disclosure describes a thin film distributed RC circuit component consisting of an inert substrate, an anodizable resistive film, an oxide dielectric layer produced upon the film and a conductive counterelectrode deposited on the dielectric layer. The resistive film is a suitable refractory metal. A pattern of spaced apertures are etched through the conductive counterelectrode to but not beyond the underlying oxide layer. The apertures must be sufficiently large to pass an anodizing solution. By selecting the thickness and resistor pattern of the anodizable film, as well as the size and spacing of the apertures, the resulting component is readily adjusted as to frequency response or other characteristics.

3,665,347

T-ATTENUATOR OR COUPLING NETWORK HAVING AN IDENTICAL CHARACTERISTIC IMPEDANCE FROM EITHER END

Jon E. Barth, Twinsburg, Ohio, assignor to Barth Electronics, Inc., Cleveland, Ohio

Filed Mar. 3, 1970, Ser. No. 16,074
Int. Cl. H01p *1/22, 5/02*
U.S. Cl. 333—81 A **1 Claim**



An attenuator or pad device which has an outer conductor in the form of a generally T-shaped body, formed with an interior cavity extending longitudinally therethrough. The cavity is also generally T-shaped in configuration having one part in the form of a double-ended expotential horn having its apex or smallest diameter at the center of the tubular body and extending continuously expotentially outwardly therefrom in opposed longitudinal directions to the outer ends of said body.

A second part of the cavity forming the stem thereof is also generally expotential in form extending from the bottom of said stem outwardly and upwardly to communicate with the double-ended cavity part at its center.

An elongated resistance element defining the inner conductor of the attenuator or pad extends centrally through the cavity and provides an impedance pad which has the same input and output magnitude whereby the device may be utilized as an interstage coupling device.

3,665,348

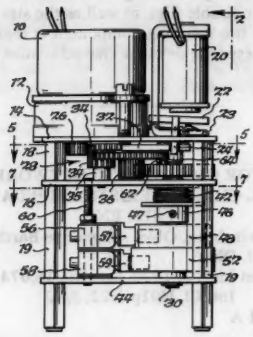
TIME DELAY RELAY

Arthur W. Haydon, Middlebury, and Harry E. Crossley, Cheshire, both of Conn., assignors to Tri-Tech, Inc., Waterbury, Conn.

Filed May 3, 1971, Ser. No. 139,699
Int. Cl. H01h *43/14*
U.S. Cl. 335—68 **9 Claims**

One or more timing switches are operated by cams driven through a gear train by a constant speed motor. After turning through a predetermined cycle a portion of the gear train is disconnected from the motor by a solenoid actuated lever arm and the gear train and cams are reset by a coiled return spring. A pair of projecting lugs mounted on the faces of a pair of adjacent gears engage with each other to stop the reset operation and ensure that the gear teeth are in precise

alignment when the driving motor is reengaged. In one embodiment, the motor is capable of being stopped substantially



instantaneously, thereby allowing the gears to be remeshed after being reset with a minimum of gear slippage.

3,665,349

REED SWITCHES

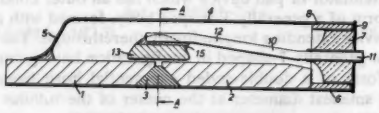
Alan Robert Beavitt, Towcester, England, assignor to Square D Company, Park Ridge, Ill.

Filed Oct. 28, 1970, Ser. No. 84,860

Claims priority, application Great Britain, Oct. 28, 1969, 52,712/69; June 5, 1970, 27,233/70

Int. Cl. H01h *1/66, 51/28*

U.S. Cl. 335—154 **4 Claims**



A reed switch comprises a pair of longitudinally spaced members of magnetizable material which constitute an electrical contact of said switch, a magnetizable armature which is movable into and out of bridging contact with said members, and a cantilever, preferably of non-magnetic material on which the armature is mounted, the cantilever being mounted so as to be electrically independent of said members and forming a second electrical contact of said switch.

3,665,350

ELECTRIC CIRCUIT BREAKER WITH ELECTROMAGNETICALLY ASSISTED CLOSING MEANS

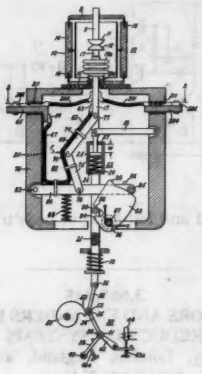
Robert V. Klint, Woodstown, N.J., assignor to General Electric Company

Filed Apr. 19, 1971, Ser. No. 135,326

Int. Cl. H04r *71/26*

U.S. Cl. 335—195 **4 Claims**

Discloses an electric circuit breaker that includes electromagnetic assist means for opposing the magnetic contact-repulsion forces developed when a high current flows through the circuit breaker. The electromagnetic assist means comprises flexible conductive means in series with the contacts of the breaker for carrying the inter-contact current through a loop-shaped path where a magnetic closing force is developed on the contacts. Only a minor portion of the total inter-contact current is conducted through the loop-shaped path. For carrying the remaining and major portion of the current, additional flexible conductive means is connected in series with the contacts and in parallel with the loop-shaped path, and this additional conductive means follows a path separate from and independent of the loop-shaped path. Sufficient closing force is obtained from the minor portion of the total current that passes through the loop-shaped path to hold the contacts engaged during the highest current surges for which the breaker is rated.



3,665,351

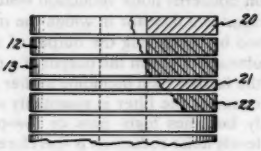
SUPERCONDUCTIVE MAGNETS

Gordon W. Donaldson; Charles D. Graham, Jr., and Howard R. Hart, Jr., all of Schenectady, N.Y., assignors to General Electric Company

Continuation of application Ser. No. 787,970, Dec. 30, 1968, now abandoned. This application July 9, 1970, Ser. No. 56,175

Int. Cl. H01f *7/22*

U.S. Cl. 335—216 **9 Claims**



Superconductive tape-wound solenoids used for the production of high magnetic fields are susceptible to being driven into the normal resistance state by flux jumping occurring in the end coils. This is caused by the high concentration of magnetic flux components perpendicular to the planes of the tapes in these coils. The performance of such solenoids may be substantially improved by providing an alternative path for such flux components through a body having a relatively high saturation magnetization such as iron or mild steel closely adjacent the end coils but electrically isolated therefrom.

3,665,352

PERMANENT MAGNET SYSTEM FOR A LOUDSPEAKER

Hermann Dietrich, Willich; Karl Schuler, Dortmund-Hoerde, and Heinz Gunter Meese, Dortmund-Aplerbeck, all of Germany, assignors to Deutsche Edelstahlwerke Aktiengesellschaft, Krefeld, Germany

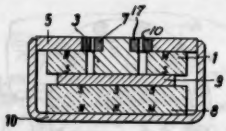
Filed May 12, 1970, Ser. No. 36,594

Int. Cl. H01f *7/00*

U.S. Cl. 335—231 **4 Claims**

A permanent magnet system is made for a loudspeaker consisting of a rod or ring-formed axial magnetic magnets

and soft iron parts. A portion of the ferromagnetic circuit in the system is made from a mechanically machinable, dense



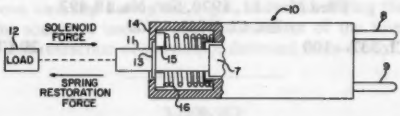
alloyed ferritic steel with higher electrical and lower magnetic resistance than soft iron and a saturation magnetism at least equal to the air gap induction required by the system.

3,665,353

SOLENOID WITH MULTI-RATE RETURN SPRING

Melvin L. Campbell, Marion, Iowa, assignor to Collins Radio Company, Cedar Rapids, Iowa

Filed Apr. 27, 1971, Ser. No. 137,916
Int. Cl. H01f 7/08
U.S. Cl. 335—258 7 Claims



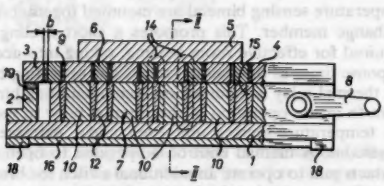
A multi-rate return spring optimizes solenoid operational efficiency by providing a spring restoring force versus deflection characteristic more nearly matching the inverse-square solenoid stroke versus force characteristic. The spring may be fashioned from two or more contiguous sections having progressively greater winding pitches such that the resulting multiple restoring force rates compositely more nearly match the solenoid force characteristic over a predetermined stroke.

3,665,354

MAGNETIC CHUCK

Maurer Werner, Oberhubstrasse 21, Zollikerberg, Switzerland

Filed Feb. 1, 1971, Ser. No. 111,353
Int. Cl. H01f 7/04
U.S. Cl. 335—295 7 Claims



A magnetic chuck in which the magnetic holding force is produced by permanent magnets and mechanically movable means are provided for diverting the magnetic flux and thus facilitate removal of the workpiece in the unclamped position. For suppressing an undesirable magnetic shunt from the magnetic chuck through the machine and therefore preventing magnetization of the tools, such as drills or milling cutters, at least one magnet member is disposed on the lower side of the base plate of the magnetic chuck, having an upper pole of identical polarity to the bottom poles of the permanent magnets, and further the base plate is magnetically isolated relative to the head plate of the magnetic chuck.

3,665,355

COVER FOR PROTECTING COATINGS OF AUTOMOBILES AND THE LIKE

Kenkichi Sasaki, and Hisashi Saikawa, both of Osaka, Japan, assignors to Yamauchi Rubber Industry Co., Ltd., Osaka, Japan

Filed Nov. 16, 1970, Ser. No. 89,897
Claims priority, application Japan, Nov. 19, 1969, 44/110014
Int. Cl. H01f 7/02
U.S. Cl. 335—306 5 Claims

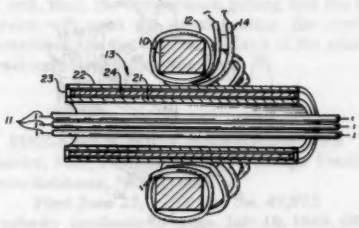
A cover for protecting coatings of automobiles and the like is a composite sheet having a substantial length and width. The composite sheet comprises a flexible sheet, a plurality of magnets arranged in spaced relation to each other on one surface of the flexible sheet, and a cushion material filling the spaces between the magnets. The magnets and the cushion material are secured to the flexible sheet. The magnets are flexible and made of a flexible plastic material having finely divided magnetized magnetic material dispersed therein.

3,665,356

DIFFERENTIAL TRANSFORMER WITH BALANCING MEANS

Ellwood S. Douglas, Orinda, and Wallace W. Wahlgren, Oakland, both of Calif., assignors to The Rucker Company, Oakland, Calif.

Filed Apr. 23, 1969, Ser. No. 818,558
Int. Cl. H01f 17/06
U.S. Cl. 336—73 2 Claims



A differential transformer having a balancing sleeve interposed between its primary and secondary windings to provide a substantially identical degree of coupling between each of the primary windings and the secondary winding. The balancing sleeve is made of magnetic and/or electrically conductive materials.

3,665,357

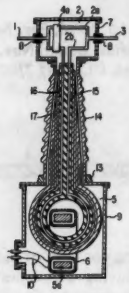
CURRENT TRANSFORMER ASSEMBLY

Denji Tsubouchi, Yokahama, and Kenji Wada, Yamato, both of Japan, assignors to Tokyo Shibaura Electric Company, Ltd., Kawasaki-shi, Japan

Filed Mar. 15, 1971, Ser. No. 124,398
Claims priority, application Japan, Mar. 16, 1970, 45/21542; Mar. 19, 1970, 45/22881; Mar. 28, 1970, 45/25821
Int. Cl. H01f 40/06
U.S. Cl. 336—73 5 Claims

A current transformer assembly includes a shunt circuit connected to a main circuit, the shunt circuit having *n* number of shunt conductors; a main current transformer for transforming current passing through one of the shunt conductors; and (*n*-1) number of current balancers having secondary windings connected to each other to enable a cir-

culating secondary current flow. Each of the current balancers is formed of two subcurrent transformers so as to fix the



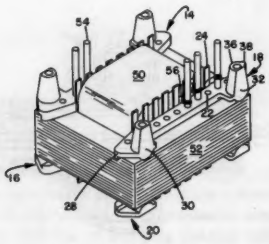
ratio of the magnitude of the currents conducted through the individual shunt conductors.

3,665,358

REACTOR COIL FORM

Carl A. Leuck, Costa Mesa, and Fritz H. Schindelbeck, Orange, both of Calif., assignors to Collins Radio Company, Dallas, Tex.

Filed Feb. 9, 1971, Ser. No. 113,845
Int. Cl. H01f *27/02*, *27/30*
U.S. Cl. 336—96 **7 Claims**



A reactor coil form or bobbin comprising shelves for holding magnetic laminations in place and structured to additionally space the reactor from a potting container. The shelves include irregularities to produce better bonding of the potting compound to the shelves and the magnetic laminations. Further, the coil form includes integral stand-off and mounting projections for positioning and holding a potted reactor to and slightly off a mounting base.

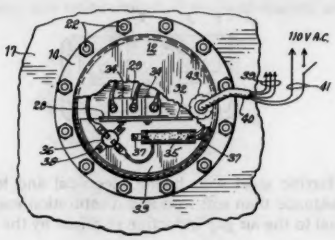
3,665,359

HEATER FOR PRESSURE SWITCH

Erhard E. Alms, 419 Valencia Avenue, Barrington, Ill.

Filed Aug. 10, 1970, Ser. No. 62,291
Int. Cl. H01h *31/00*
U.S. Cl. 337—2 **1 Claim**

A flexible diaphragm-type pressure switch sensitive to light pressures on the order of 7 ounces to 11 ounces for use in freezing, moist atmospheres containing plant particles such as husks, cracked seeds and leaves which are likely to cake and freeze on the diaphragm, thus rendering the diaphragm insensitive to its designed pressures. A thermostatically controlled heating element is incorporated in the switch without changing the external dimensions of the switch, the heating element preventing freezing of moisture on the diaphragm



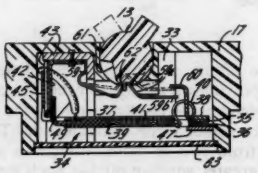
and drying the plant particles accumulated thereon so that they can be carried away by air currents.

3,665,360

THERMOSTAT

Alexander R. Norden, 350 Central Park West, New York, N.Y.

Filed Mar. 11, 1970, Ser. No. 18,492
Int. Cl. H01h *61/00*
U.S. Cl. 337—100 **29 Claims**



A thermostat for an electric heater containing a thermal relay and a temperature-sensing unit in the same assembly. The thermal relay is mounted above the temperature sensing unit so that the convection air currents resulting from the heat generated by the thermal relay induce room-temperature air to flow past the temperature-sensing unit and this effect speeds up the response of the temperature sensor to the ambient temperature of the room. Heating of the relay contacts due to the relatively heavy heater current helps to induce the convection air currents and does not cause any appreciable "droop." An anticipator resistor and the ambient temperature sensing bimetal are mounted together on a heat-exchange member. This promotes a short cycling time, as required for effective room heating, taking into account the response times of the thermal relay. The operating bimetal of the thermal relay is mounted on a compensating bimetal element to insure operation of the thermal relay in response to the temperature-sensing unit even under extreme weather conditions. A manual control is provided to open the relay contacts and to operate an additional switch for breaking the room-heater curcuit at both sides of the line.

3,665,361

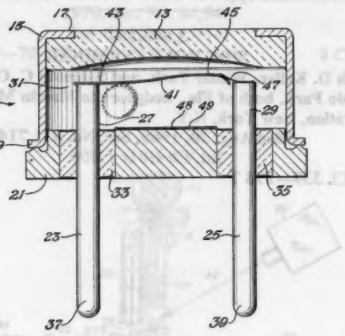
FUSE WITH RETRACTABLE INDICATOR STRIP

Robert A. Williams, 55 Bounty Road East, Fort Worth, Tex.

Filed Aug. 28, 1970, Ser. No. 67,892
Int. Cl. H01h *85/30*
U.S. Cl. 337—265 **10 Claims**

A fuse for monitoring low level electrical energy by means of a strip of resilient material disposed beneath a translucent surface, with one end supported by a portion of a terminal pin inside an enclosure, and the other end supported by a wire to another terminal pin. The strip is formed to have

residual stresses, such that when electrical energy at a predetermined level disintegrates the wire, the strip retracts. The width of the strip is such that the retracted position is



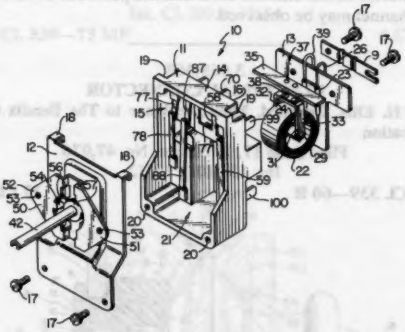
easily detected as contrasted with the extended position. To improve visibility during the night, and often during the day, a light source is used in one embodiment of the invention such that retraction of the strip is detected more easily.

3,665,362

THERMOSTATIC CONTROL DEVICE AND SYSTEM UTILIZING THE SAME

Henry F. Hild; Siegfried E. Manecke, and James L. Shaw, all of Indiana, Pa., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Oct. 7, 1970, Ser. No. 78,737
Int. Cl. H01h *37/28*; H01h *37/42*
U.S. Cl. 337—322 **26 Claims**



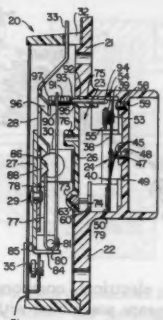
A coiled tube having opposed ends one of which being interconnected to a frame means and the other being movable relative thereto and being interconnected to a temperature sensing bulb whereby expansion and contraction of the fluid in the bulb causes movement of the other end of the tube relative to the frame means. A pair of switch blades are carried by the frame means and normally are moved toward each other for electrical contact therebetween. Control means is carried by the frame means for selectively adjusting the position of one of the switch blades relative to the frame means. The other end of the tube carries means for engaging against the other of the blades to cause movement thereof in a direction away from the one blade when a certain temperature is sensed by the bulb whereby the setting of the control means determines the sensed temperature that will cause the tube to open the switch blades.

3,665,363

THERMOSTATIC CONTROL DEVICE AND SYSTEM UTILIZING THE SAME

David M. Rosenberg, and Siegfried E. Manecke, both of Indiana, Pa., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Oct. 8, 1970, Ser. No. 79,122
Int. Cl. H01h *37/12*
U.S. Cl. 337—361 **30 Claims**



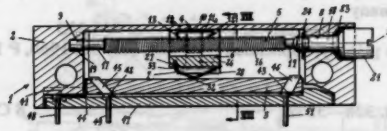
Electrical switch means carried by frame means. A U-shaped bimetal member defining a pair of legs interconnected at adjacent ends thereof by an elbow portion pivotally mounted to the frame means. A plunger means is movably carried by the frame means and is disposed between one of the legs of the bimetal member and the switch means to operate the switch means in relation to the position of the one leg relative to the frame means. Cam means is movably carried by the frame means and acts on the other leg of the bimetal member to adjust the pivotal position of the bimetal member and, thus, the temperature setting that the thermostatic device will open the switch means, the cam means being movable across the longitudinal axis of the other leg of the bimetal member to adjust the same.

3,665,364

FINE-ADJUSTMENT POTENTIOMETER

Jean Maurice, Nice, France, assignor to Societe Francaise De L'Electro-Reistance, Nice, France

Filed June 22, 1970, Ser. No. 47,972
Claims priority, application France, July 18, 1969, 6924642
Int. Cl. H01c *9/02*
U.S. Cl. 338—180 **3 Claims**

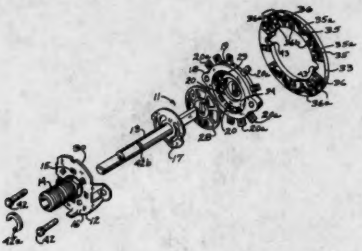


A fine-adjustment potentiometer which comprises a slider in contact with a resistance track and with a conductive band, a device for controlling the displacement of the slider, and an external protective casing fitted with a detachable cover. The potentiometer comprises a lead-screw which can be operated from the exterior of the casing, a sliding unit through which the lead-screw passes and which comprises a slider applied against the resistor and a rider placed on the side opposite to the slider and slidingly applied against the casing. The sliding unit further comprises resilient arms engaged with the lead-screw and intended to drive the moving system as thus constituted. The actuating device thus permits accurate displacement of the slider and stopping of this latter at the end of travel while preventing any damage.

3,665,365
MULTI-IMPEDANCE ELECTRICAL COMPONENT

Clinton W. Hartman, Elkhart, Ind., assignor to CTS Corporation, Elkhart, Ind.

Continuation of application Ser. No. 741,720, July 1, 1968, now abandoned. This application Feb. 8, 1971, Ser. No. 113,759
Int. Cl. H01c 5/06
U.S. Cl. 338—190 8 Claims

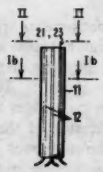


Multi-impedance electrical component having an impedance selecting means assembled with at least one circuit wafer supporting a plurality of operationally discrete film type impedance elements, i.e., film type elements supported in groups on the wafer to form a single integrated mechanical structure, the film type impedance elements being useful in an electrical circuit in lieu of structurally independent resistors, capacitors, and inductors. Film type conductive interconnectors are connected with the operationally discrete impedance elements and a conductive contactor forming part of the impedance selecting means is movable to different contact positions for completing an electrical connection with selected ones of the conductive interconnectors. An indexical detent mechanism cooperates with a shaft for selectively changing the position of the conductive contactor, operation of the shaft causing one or more of the operationally discrete impedance elements to be connected in a circuit between termination points on the wafer. The wafer is formed of heat resistant material, and the operationally discrete impedance elements are formed from film type material and are precisely adjusted to a nominal impedance value by removing portions of the film from the surface of the wafer.

3,665,366
HALL PROBE FOR MEASURING AN AXIAL MAGNETIC FIELD IN A BORE

Helmut Freller, and Magdalena Obitz, both of Nuremberg, Germany, assignors to Siemens Aktiengesellschaft, Berlin, Germany

Filed July 1, 1969, Ser. No. 838,233
Claims priority, application Germany, July 12, 1968, P 17 66 756.6
Int. Cl. H01c 7/16
U.S. Cl. 338—32 H 8 Claims

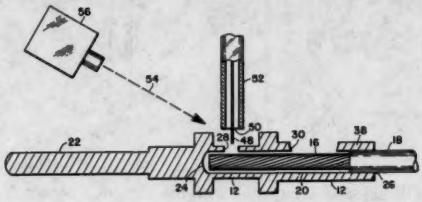


Four molybdenum wires are embedded in a hardened glass rod having a small diameter and resistant to extreme temperature changes. Each of the wires has an end at an axial end surface of the rod coplanar with such surface. A layer of semiconductor material of specific configuration on the end surface of the rod covers the wire ends and has a temperature coefficient of the Hall voltage and the electrical specific resistance which is less than or equal to 0.1 percent per degree Centigrade.

3,665,367
SIDE HOLE TERMINAL

Joseph D. Keller, Winter Park, and Solomon C. Osborne, Orlando Park, both of Fla., assignors to Martin Marietta Corporation, New York, N.Y.

Filed Aug. 20, 1969, Ser. No. 851,714
Int. Cl. H01r 11/06
U.S. Cl. 339—275 T 13 Claims

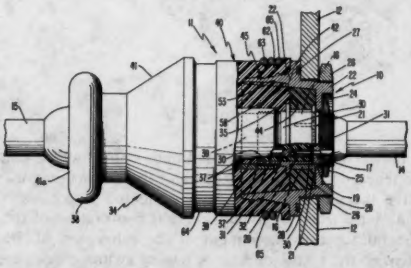


An electrical terminal designed to be attached to an electrical conductor in the form of a conventional insulated wire or the like, by means of a solder connection. The body portion of the terminal comprises a channel extending into its interior and at least one hole or aperture formed in the side of the body portion intermediate the extremities of the channel and communicating with the interior of the channel. Solder applied to the interior of said channel through the side hole flows about the connector within the channel due to capillary action. Proper filling of the channel with a required minimum amount of solder may be evidenced by the provision of a second hole also formed in the side of the body portion a spaced distance from the first hole and communicating with the interior of the channel such that the presence of solder in the channel may be observed.

3,665,368
ELECTRICAL CONNECTOR

John H. Ellis, Concord, Mass., assignor to The Bendix Corporation

Filed June 17, 1970, Ser. No. 47,076
Int. Cl. H01r 13/52
U.S. Cl. 339—60 R 17 Claims



A plug and socket type electrical connector adapted for use under liquid such as water or under damp conditions. The connector has encapsulating means for securely sealing the immersed connector parts when they are in mated position, to maintain the contacts and other elements thereof dry. The encapsulating means is pressure responsive, so that its sealing effectiveness increases as the assembly is subjected to increased external liquid pressure.

3,665,369

MOUNTING DEVICE FOR PRINTED WIRING BOARDS

Charles E. Ester, Glendale, Ariz., assignor to Honeywell Information Systems INc.

Original application Dec. 26, 1967, Ser. No. 693,599, now Patent No. 3,550,062. Divided and this application June 10, 1970, Ser. No. 44,941

Int. Cl. H01r *13/54*

U.S. Cl. 339—75 MP 2 Claims

This invention relates to mounting of printed wiring boards, and more particularly to a mounting device for mechanically attaching a printed wiring board to a backpanel.

3,665,370

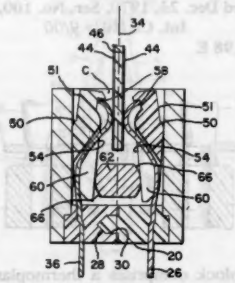
ZERO-INSERTION FORCE CONNECTOR

Karl Wilhelm Hartmann, Camp Hill, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 8, 1971, Ser. No. 113,421

Int. Cl. H01r *13/54*

U.S. Cl. 339—75 MP 4 Claims



The disclosure relates to a cam actuated ceramic substrate edge connector or the like. The connector has a cavity in one wall for receiving the substrate edge. Located on either side of the inserted substrate edge within the cavity are rocker member actuated electrically conductive leaf spring contacts movable from a first position offering zero-insertion force of the substrate edge to a second position of electrical engagement with circuitry located on opposite substrate surfaces. An elongated cam member pivots from a first position to a second position to actuate the rocker members.

3,665,371

ELECTRICAL CONNECTORS

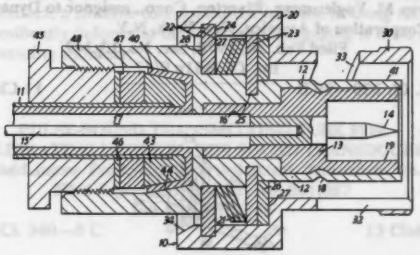
Jack Cripps, Herne Bay, England, assignor to The Bunker-Ramo Corporation, Oak Brook, Ill.

Filed May 19, 1970, Ser. No. 38,701

Claims priority, application Great Britain, May 19, 1969, 25,442/69

Int. Cl. H01r *13/54*

U.S. Cl. 339—90 C 11 Claims



Electrical plug-and-socket connectors have plastics locking sleeves, preferably colored for coding, for couping and retaining the connectors to mating connectors, and the sleeves can yield outwardly, have some resilience and are arranged to interlock onto the respective connector bodies with a "snap" action when the sleeves are pushed onto their bodies in assembly. In one connector, the body carries a washer that is a snap-in fit in a groove in the resilient locking sleeve, and in another connector, the resilient locking sleeve has an inwardly-pointing lip which snaps into a space between two shoulders on the body. The sleeve can be one-half of a bayonet- or screw-type coupling.

3,665,372

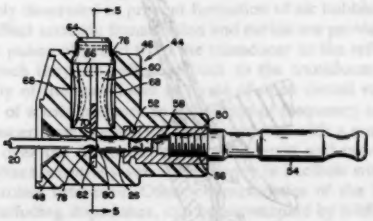
ELECTRODE RETAINING CHUCK HANDLE ASSEMBLY WITH ADAPTER UNIT

John P. Goode; John J. Saeli, both of Rochester, and James P. Sformo, Spencerport, all of N.Y., assignors to Sybron Corporation, Rochester, N.Y.

Original application Jan. 8, 1969, Ser. No. 789,686, now Patent No. 3,597,582. Divided and this application Aug. 3, 1970, Ser. No. 67,640

Int. Cl. H01r *13/54*

U.S. Cl. 339—91 R 2 Claims



An electrosurgical chuck handle assembly with an adapter unit is disclosed. The chuck handle assembly is designed to provide a means for retaining the electrode used for cutting or coagulating and is held firmly with provisions for changing the electrode. The chuck handle assembly is constructed of materials having sufficient heat distorting properties to allow the handle to distort whenever the assembly is sterilized by heating, thereby rendering the handle ineffective for further reuse. The distortion feature helps eliminate open circuits in the assembly which occur from repeated heat sterilizing.

Also disclosed is an adapter unit for receiving the terminal plug of the chuck handle assembly and electrically connecting the terminal plug to an existing electrosurgical unit. The adapter unit contains novel locking means whereby the terminal plug is retained within the adapter unit in an electrical contact position thereby preventing inadvertant disconnection from the electrosurgical unit.

3,665,373

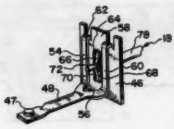
PUSH-IN CONNECTOR SWITCH

Harry M. Voglesonger, Riverton, Conn., assignor to Dynamics Corporation of America, New York, N.Y.

Filed Feb. 24, 1970, Ser. No. 13,342

Int. Cl. H01n *9/12*

U.S. Cl. 339—95 D **11 Claims**



An appliance switch including a push-in electrical terminal safety assembly in which a bared conductor wire is simply inserted endwise in guided relationship transversely through an insulating side wall to be received normal to a spring metal base element held in place by a cover where the bared wire is clamped between the ends of two cooperating aligned and converging spring metal tongues in the base element that are disposed against the opposite side of the wall.

3,665,374

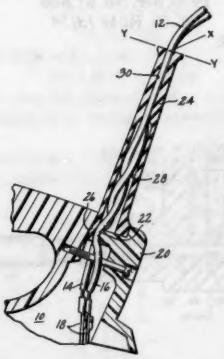
APPLIANCE CORD-CONNECTING STRUCTURE

Bryce A. Denton, Ontario, Calif., assignor to General Electric Company

Continuation-in-part of application Ser. No. 886,058, Dec. 18, 1969, now abandoned. This application May 28, 1970, Ser. No. 41,189

Int. Cl. H01r *13/56, 13/58*

U.S. Cl. 339—101 **11 Claims**



The invention discloses a cord-connecting structure for stress relief beyond an appliance envelope using the usual elongated flexible bushing around the cord and anchored to the appliance to prevent sharp cord bends at the appliance. The bushing may have different internal cross sections to conveniently accommodate in part of its length twisted and preferably separated conductors and, in the rest of its length, to help rotationally restrain the cord by the bushing itself or equivalent. Thus, constant flexing of the cord, even with the tough new materials, imposes substantially no or very minimal stresses on the conductors throughout resulting in extremely long life and safer cords.

3,665,375

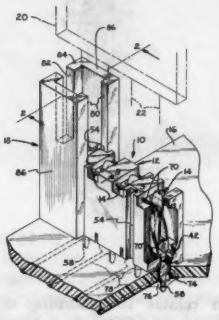
CONNECTOR BLOCK AND METHOD OF MAKING THE SAME

William C. Thoms, East Berlin, and Lloyd Mancini, New Cumberland, both of Pa., assignors to Berg Electronics, Inc., New Cumberland, Pa.

Filed July 23, 1970, Ser. No. 57,547

Int. Cl. H05k *1/07;* **H01r** *33/76*

U.S. Cl. 339—192 R **10 Claims**



A connector block formed from an extruded hollow insulating body of uniform cross section having grooves in the sides of the body at selected locations aiong its length and terminals inserted into the body through certain of the grooves. Contacts are inserted through grooves to establish electrical connections with the terminals in the body and portions of the terminals extend from the body for establishing electrical connections with circuitry on the board.

3,665,376

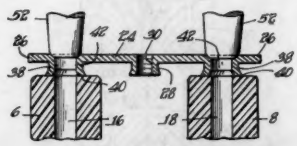
TERMINAL BLOCK AND METHOD OF MAKING THE SAME

Ray J. Paris, and Harry M. Rudd, both of Erie, Pa., assignors to Teledyne Mid-America Corporation, Hawthorne, Calif.

Filed Dec. 23, 1970, Ser. No. 100,876

Int. Cl. H01r *9/00*

U.S. Cl. 339—198 E **3 Claims**



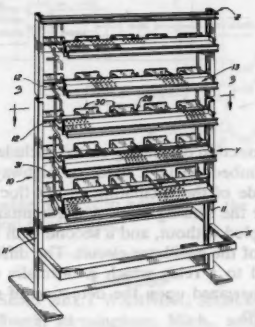
A terminal block comprises a thermoplastic body and a plurality of jumper bars. Each jumper bar has end portions with tubular projections that define holes in the jumper bar through which conductor-retaining screws are inserted. Each projection terminates in a radially outwardly extending locking ring. The jumper bar is secured to the terminal block with the projections embedded therein whereby the retaining ring on each projection locks with the plastic of the body. The process for attaching the jumper bar to the body utilizes the application of axial pressure to the jumper bar while at the same time applying axial vibratory forces at a sufficient frequency to cause the plastic to flow around the retaining rings and lock therewith.

3,665,377

FRAME AND WIRE TERMINATION BLOCK ASSEMBLY

Joseph H. MacKenzie, Jr., 431 Prairie Avenue, Wilmette, Ill.

Filed Jan. 27, 1971, Ser. No. 110,164
Int. Cl. H01r 9/00
U.S. Cl. 339—198 G 14 Claims



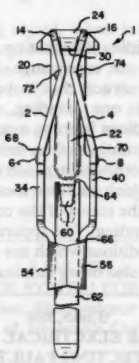
A frame and wire termination block assembly is provided which enables a plurality of wire termination blocks mounted on the frame to independently assume various selected positions of tilted adjustment so as to facilitate connecting or disconnecting of various wire leads with respect to one or more blocks.

3,665,378

SPRING RECEPTACLE CONTACT AND HOUSING THEREFOR

Kemper Martel Hammell, Harrisburg, and Karl Lester Kaylor, Middletown, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Sept. 4, 1970, Ser. No. 69,696
Int. Cl. H01r 9/08
U.S. Cl. 339—217 S 7 Claims



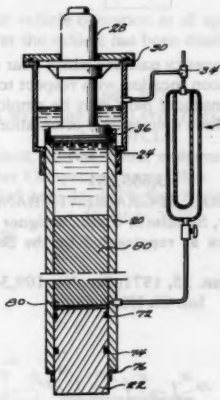
A spring receptacle contact and a housing therefor, the contact including a pair of resilient cantilever spring fingers which cooperate to provide a receptacle. The fingers are each provided with a button compressibly engaged on opposed sides of a housing recess into which the spring contact is inserted. The contact is further provided with a tab in spaced relationship from a pair of flaps. Together, the tab and flaps are crimped over an electrical post which projects from the housing recess. The receptacle contact is further provided with an elongated embossed base which terminates in a generally T-shaped end portion which seats laterally within the housing recess. Such end portion additionally carries a tine which abuts against a shoulder in the housing to prevent withdrawal of the contact receptacle. A pair of diagonally projecting levers compressibly engage against a side of the housing recess for seating the longitudinal base of the receptacle contact laterally against an opposed side of the housing recess. Additionally, the levers abut against a shoulder provided in the housing recess to lock the recess to lock the receptacle contact therein. To remove the receptacle contact, a suitable tool is inserted into the housing recess for resiliently deforming the tine and disengaging it from the cooperating shoulder.

3,665,379

PULSE-SOUND TRANSMITTING TUBE FOR CALIBRATING UNDERWATER SOUND TRANSDUCERS

Winfield James Trott, 7053 Wardell Street, Annandale, Va.

Filed Sept. 25, 1969, Ser. No. 861,087
Int. Cl. G01s 9/66
U.S. Cl. 340—5 C 13 Claims



A method and apparatus for calibrating sound transducers wherein the transducer to be calibrated is mounted so as to radiate sound into a water filled, thick walled, metal tube sealed at the transducer end by a rubber diaphragm and at the other end by a metal reflector that approximates a quarter wave in length. The water sealed in the tube is preferably deaerated to prevent formation of air bubbles that would affect acoustic transmission and means are provided to transmit pulses of sound from the transducer to the reflector from which they are reflected back to the transducer. The sensitivity of the transducer in terms of open circuit voltage per unit of sound pressure as a function of frequency can be simply ascertained by driving the transducer with a constant current over the frequency range of interest and recording the resultant sensitivity versus frequency in decibels with a 1 volt/microbar reference. Other characteristics of the transducer, including impedance, can be ascertained by adding an absorber in front of the reflector.

3,665,380

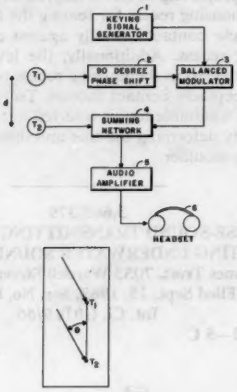
ELECTRONIC AIDS FOR AQUANAUTS

Harris A. Stover, Cedar Rapids, Iowa, assignor to Collins Radio Company, Cedar Rapids, Iowa

Filed June 18, 1970, Ser. No. 47,408
Int. Cl. G01s 3/00
U.S. Cl. 340—6 R 20 Claims

An aural orientation aid for an aquanaut uses pairs of space separated receiving transducers which are integrated

into the aquanaut's headpiece for reception of a sound beacon signal. The perpendicular bisector of the transducer pair baseline defines a reference plane. Received signal is processed to present aurally distinguishable tone intensity



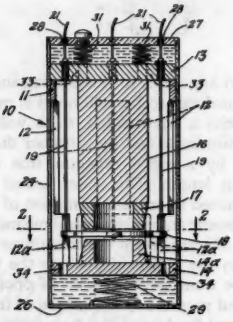
patterns and/or frequency patterns which bear a definite relationship to the beacon location with respect to the reference plane. Multiple transducer pairs may be employed to aurally provide complete three dimensional orientation.

3,665,381

MOVABLE COIL BI-GRADIENT TRANSDUCER

Benjamin B. Bauer, Stamford, Conn., assignor to The United States of America as represented by the Secretary of the Navy

Filed Jan. 25, 1971, Ser. No. 109,347
Int. Cl. H01b *13/00*
U.S. Cl. 340—8 **7 Claims**



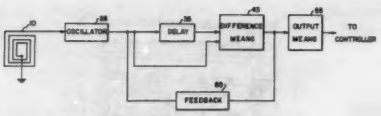
A movable coil bi-gradient transducer responsive to the angle of arrival of a given sound wave. An orthogonal array of four coils are embedded in a flat non-magnetic disk and suspended in the air gap of an annular magnetic unit by four thin rods. Opposite coils are wired in series with only their outer halves normally in the annular field of flux whereby the combined voltages of the coils is equal to zero. A cylindrical acoustically transparent boot, filled with silicon oil, encases the magnetic unit and suspended disk. Acoustic pressure waves arriving at the outside of the boot are transmitted through the silicone oil causing lateral displacement of the four coils in the same direction as the pressure wave to produce electrical output signals at respective pairs of coils indicative of the sine and cosine functions of the arrival angle of the pressure wave.

3,665,382

VEHICLE DETECTION APPARATUS

Gregory Siklos, Bronx, N.Y., assignor to The Marbelite Company, Inc., Brooklyn, N.Y.

Filed Oct. 30, 1969, Ser. No. 872,487
Int. Cl. G08g *1/01*
U.S. Cl. 340—38 L **15 Claims**



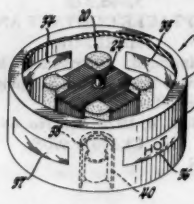
A vehicle detection oscillating circuit includes an inductive sensing loop imbedded in a road, or highway. The output signal amplitude of the oscillating circuit fluctuates when a vehicle is near the sensing loop. A differential amplifier has one input coupled without, and a second with a delay circuit to the output of the oscillator circuit. The differential amplifier is coupled to a relay which is normally energized and becomes de-energized upon the detection of a vehicle near the sensing loop.

3,665,383

VEHICLE CONDITION RESPONSIVE MONITORING SYSTEM HAVING PRIORITY INDICATION

Douglas I. Fales, Flint, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 20, 1970, Ser. No. 91,490
Int. Cl. G08b *19/00*
U.S. Cl. 340—52 F **3 Claims**



Apparatus for providing information as to plurality of conditions using a single air core gauge. Each condition being monitored controls a switch that in turn controls the energization of at least one winding, the magnetic fields generated by the windings forming a resultant magnetic field that controls the orientation of an indicia-bearing rotatable disc. When one or more windings are energized a lamp illuminates the indicia which the disc locates at a certain position so as to indicate the status of the condition which caused energization of the winding. The apparatus also gives priority to information on conditions which are of greater importance than other conditions also being monitored.

3,665,384

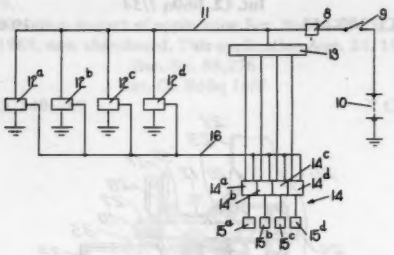
ROAD VEHICLE ELECTRICAL SYSTEM WITH TRANSDUCERS DETECTING FAULTS AND PRODUCING UNIQUE OUTPUTS OPERATING A RECEIVING AND DISPLAY UNIT

Andrew Peter Ives, Solihull, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Aug. 25, 1970, Ser. No. 66,699
Claims priority, application Great Britain, Aug. 26, 1969, 42,455/69
Int. Cl. B60q *1/00*
U.S. Cl. 340—52 F **3 Claims**

A fault detecting system for a road vehicle includes a plurality of fault transducers, each producing its own unique

output in the event of a fault. The receiving and display unit is operable by these unique outputs for indicating each fault,



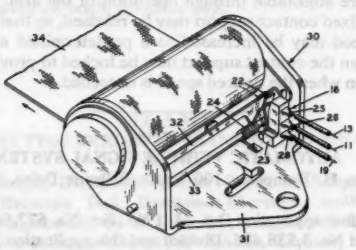
and a single cable is used to connect all the transducers to the receiving and display unit.

3,665,385

VEHICLE SEAT BELT WARNING SIGNAL SYSTEM

Frederick C. Booth, Birmingham, Mich., assignor to Allied Chemical Corporation, New York, N.Y.

Filed Jan. 15, 1971, Ser. No. 106,822
Int. Cl. B60r *21/10*
U.S. Cl. 340—52 E 14 Claims



A seat belt warning signal, when initiated, indicates that one or more seat belts provided for vehicle occupant's use is not fastened about the occupant. A switch in the warning signal electrical circuit is biased in a first position. It is forced into a second position, initiating the signal, when a locking member, provided in the retractor assembly, is disposed in its non-locking position corresponding to full belt retraction. A timer is provided to initiate the signal if the bell is disposed in its unretracted position for a time longer than a reasonable driving period.

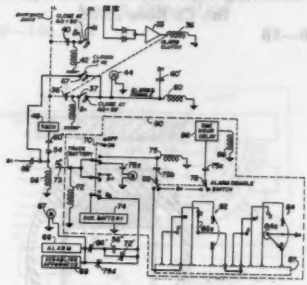
3,665,386

ANTI-HIJACK SYSTEM FOR VEHICLES

Thomas J. Dosch, Jupiter, Fla., assignor to Electronic Systems Division, a division of Dynamics Corporation of America, Boynton Beach, Fla.

Filed Dec. 18, 1970, Ser. No. 99,354
Int. Cl. B60r *25/00*
U.S. Cl. 340—53 13 Claims

An anti-hijack system carried by a vehicle includes means for monitoring the route being traveled by the vehicle and means for continuously comparing the traveled route with a stored preprogrammed route. If the vehicle deviates materially from the programmed route, at any time, vehicle disabling means and an alarm means are actuated. The system includes means for determining the position of the vehicle and means for deactiviating the disabling means when the vehicle speed is below a prescribed low speed. Also included in the system is a means for deactivating the disabling means



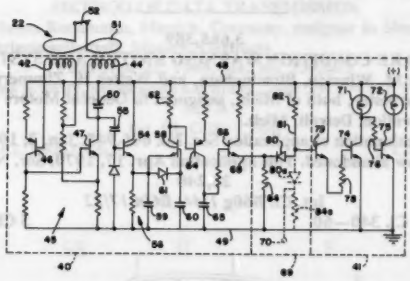
and thus permit vehicle operation at all speeds at a predetermined time after the vehicle has been disabled.

3,665,387

SIGNALLING SYSTEM FOR LOW TIRE CONDITION ON A VEHICLE

Robert S. Enabnit, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Aug. 31, 1970, Ser. No. 68,445
Int. Cl. B60c *23/02*
U.S. Cl. 340—58 17 Claims

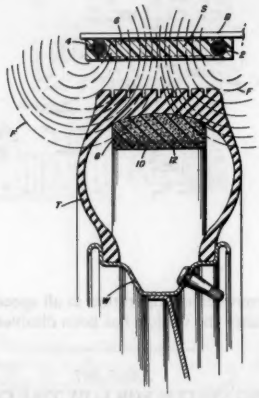


A fail-safe low tire pressure warning system adaptable for any number of wheels of a vehicle and providing dashboard indications of system operation and low pressure conditions while the vehicle is in motion. A pair of coils mounted on each wheel are interconnected under normal conditions by a switch responsive to tire pressure and periodically, due to wheel rotation, quench an oscillator circuit by reversing the normal magnetic field occurring in a second pair of coils in the oscillator. Pulses generated as a result of the quenching are accumulated to form a signal for controlling lamp indicator circuits. A low pressure condition or inoperativeness of the circuit is recognized by a red lamp indication or absence of any indication. A minimal warning system for a multiple wheeled vehicle using diode logic is described as are tire pressure switches for truck and passenger car applications.

3,665,388
TIRE AIR PRESSURE DETECTION AND SIGNALLING DEVICE

Erich Cornelius Johnsen, Victoria, B. C., Canada, assignor to Eltico Manufacturing Ltd., Victoria, British Columbia, Canada

Filed Aug. 12, 1969, Ser. No. 849,397
Int. Cl. B60c 23/06
U.S. Cl. 340—58 2 Claims

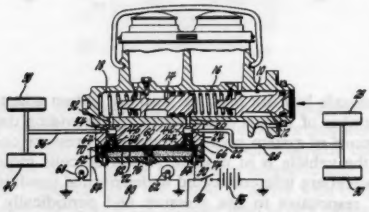


An apparatus for detecting dangerous deflation of automobile tires and for signaling the existence of the deflation. A sensor in the form of an inductance device is positioned at a fixed distance from the axis of rotation of the wheel. A metallic annulus is carried within the tire casing and is moved away from the sensor to change the reactance of the inductance when the tire is dangerously deflected. The change of inductance is used to operate a relay for operating a signaling device.

3,665,389
BRAKE CONDITION WARNING SWITCH AND SYSTEM

John M. Winston, Birmingham, and Walter H. Zimmerman, Rochester, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Continuation of application Ser. No. 606,945, Jan. 3, 1967, now abandoned. This application Apr. 17, 1970, Ser. No. 28,240
Int. Cl. B60g 1/44; B60t 17/22
U.S. Cl. 340—60 3 Claims

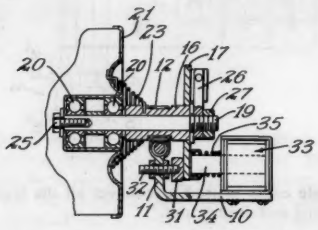


This specification describes a pressure failure indicating device for use with dual hydraulic master cylinders in a vehicle braking system. This system senses a loss of pressure in either of two power chambers to energize a warning lamp in one of the pressures is not up to a predetermined value and also energizes a stop light when pressure in either chamber is up to a predetermined value.

3,665,390
SPEED INDICATING DEVICE

Robert E. Lee, North Branch, Minn.

Filed May 13, 1970, Ser. No. 36,957
Int. Cl. B60q 1/54
U.S. Cl. 340—62 10 Claims

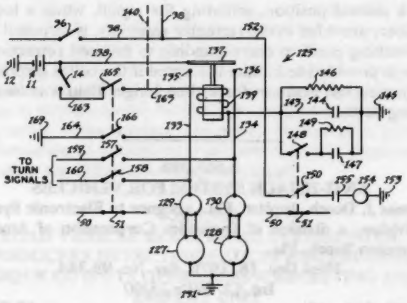


A speed indicating device is provided which may be adjusted to indicate a maximum and a minimum speed as the vehicle is in motion. A pair of switches or contacts are provided which indicate maximum and minimum speeds which may be perhaps ten miles per hour different. A fan or propeller actuates an arm which will oscillate between contacts depending upon the vehicle speed. However, the contacts are adjustable through operation of the arm. The normally fixed contact support may be released, so that the vehicle speed may be increased to a predetermined maximum, and then the contact support may be locked to provide an indication when the desired speed is exceeded.

3,665,391
AUTOMATIC VEHICLE SIGNAL SYSTEM

William H. Bumpous, 100 South Bellevue Drive, Nashville, Tenn.

Original application Oct. 24, 1967, Ser. No. 677,606, now Patent No. 3,538,496. Divided and this application June 15, 1970, Ser. No. 57,430
Int. Cl. B60q 1/38, 1/44
U.S. Cl. 340—67 6 Claims

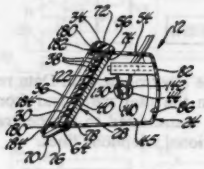


An electrical circuit for a motor vehicle including a plurality of electrical signals, an inertial starting switch, a time delay mechanism and one or more inertial signal switches to energize the signals for brief periods of time to indicate different operational conditions of the vehicle, including different degrees of deceleration.

3,665,392
VEHICLE DRIVER-ACTUATED SAFETY SIGNAL LIGHT ASSEMBLY

John T. Annas, 2644 Indian Mount South, Birmingham, Mich.

Continuation-in-part of application Ser. No. 817,543, Apr. 18, 1969, now abandoned. This application Aug. 24, 1970, Ser. No. 66,276
Int. Cl. B60q *1/44*
U.S. Cl. 340—67 7 Claims

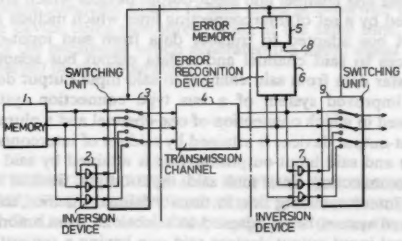


A driver communication signal mounted against the front windshield of a motor vehicle, visible to pedestrians and oncoming traffic and automatically energized upon brake application to indicate driver's intention to stop. The invention provides a double light source and driver-observed light source monitoring means as well as provision to ensure good visibility even on bright sunshine days.

3,665,393
CORRECTING ERRORS IN TRANSMITTED BINARY DATA

Werner Brune, Darmstadt; Gunter Schwartz, Seligenstadt; Ernst Hermann Dull, Darmstadt-Eberstadt, and Edgar Polly, Seligenstadt, all of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt, Germany

Filed June 8, 1970, Ser. No. 44,254
Claims priority, application Germany, June 6, 1969, P 19 28 673.8; May 23, 1970, P 20 25 340.1
Int. Cl. G08c *25/00*
U.S. Cl. 340—146.1BA 18 Claims

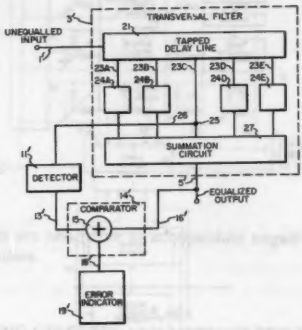


Single errors occurring in parallel transmitted binary data words, due to one path of the transmission channel having a fault which causes it to invariably transmit one binary value or the other, are corrected by transmitting the complement of each word found to contain such error and inverting the transmitted complement word at the output end of the path.

3,665,394
DATA ERROR DETECTOR FOR DETERMINING THE ERROR RATE PRIOR TO EQUALIZATION

Adam Lender, Palo Alto, and Berton E. Dotter, Jr., Belmont, both of Calif., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Sept. 23, 1970, Ser. No. 74,786
Int. Cl. G08c *25/00*
U.S. Cl. 340—146.1AX 9 Claims

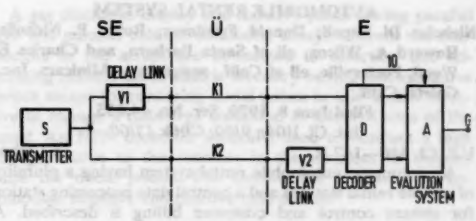


A transversal filter or equalizer will reduce to zero, errors that result from amplitude or phase distortion in the transmission facility where such distortion is within the equalization range of the transversal filter. The equalized output is used as a reference and is connected to one input of a comparator. The unequalized data signal is connected to another input of the comparator and the comparator produces an error signal at its output whenever an error occurs. The error signal actuates an indicator such as an impulse counter thereby giving bit-by-bit error indications.

3,665,395
METHOD OF DATA TRANSMISSION

Karlheinz Bochmann, Munich, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed June 25, 1968, Ser. No. 739,683
Claims priority, application Germany, June 29, 1967, P 15 12 525.4
Int. Cl. G08c *25/00*
U.S. Cl. 340—146.1 3 Claims

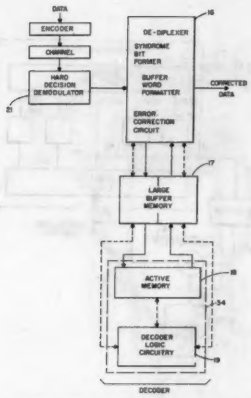


A method of transmitting data over connection paths subject to signal distorting influences wherein the transmitted message signals comprise parity bits interspersed according to a predetermined ratio with the individual information bits comprising the message signal. The message signals are transmitted in the form of two time spaced transmission signals of the above described type in different frequency channels.

3,665,396
SEQUENTIAL DECODING

George David Forney, Jr., Lexington, Mass., assignor to Codex Corporation, Watertown, Mass.

Filed Oct. 11, 1968, Ser. No. 766,738
Int. Cl. H03k 13/34; H04l 1/10
U.S. Cl. 340—146.1 21 Claims



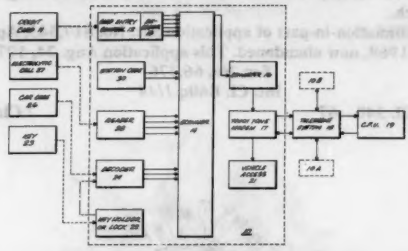
An improved error-correcting decoder for convolutional codes, of the sequential decoding type, is described. By restriction of received digit quantization to hard decisions, the number of alternatives in a single decoding search move is made sufficiently small that an entire move can be completed in one cycle of a synchronous clock. An efficient organization of the decoder memory is disclosed in which the decoder logic circuitry operates on a small, fast memory, while a larger, slower bulk buffer memory interfaces with the channel, stores data, and exchanges bits with the small fast memory on demand. The bulk memory contains variable amounts of decoded and undecoded data, which together comprise a constant capacity. A new buffer memory employing untapped shift registers is described. Use of a syndrome-forming circuit to preprocess the data is disclosed. An automatic resynchronization method in which a number of stored syndrome bits are set to 0 is presented. These features in combination are employed to produce efficient communication at high data rates over satellite channels.

3,665,397
AUTOMOBILE RENTAL SYSTEM

Nicholas Di Napoli; Donald Friedman; Robin P. Nicholls; Howard A. Wilcox, all of Santa Barbara, and Charles E. Wood, Porterville, all of Calif., assignors to Minicars, Inc., Goleta, Calif.

Filed June 8, 1970, Ser. No. 44,055
Int. Cl. H04q 9/00; G06k 15/00
U.S. Cl. 340—147 R 16 Claims

An automatic automobile rental system having a plurality of remote rental stations and a central data processing station for system control and customer billing is described. A system user employs a credit card that is automatically read at a rental station to identify the user, and this information is checked at the central station to verify that the card holder is entitled to receive an automobile. The same card identifies the holder when the automobile is returned to the same or a different rental station. An ignition key and machine-readable car identification and mileage module are interconnected for reading and dispensing at a rental station and for use in operating an automobile. Mileage or other measure of usage of the rented automobile is recorded in an electrolytic cell as a state of charge proportional to mileage. The cell is transferred to the automobile for mileage recording and to the rental station for discharge and mileage reading. Standard pulses of charge in a number proportional to mileage are

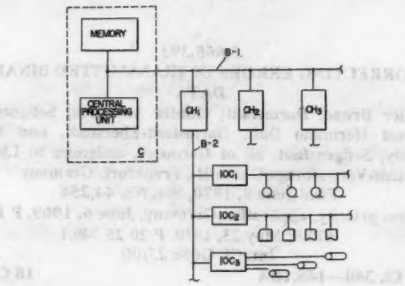


used to charge the electrolytic cell. Data read from the electrolytic cell, from the user card, and from the automobile identification are transmitted to the central data processing unit over conventional telephone lines.

3,665,398
INPUT/OUTPUT MULTIPLEX CONTROL SYSTEM

Hidetoshi Kawai; Hajime Iizuka, both of Tokyo-to; Takuo Shinkai, and Yoshiro Yoshioka, both of Kawasaki-shi, all of Japan, assignors to Kogyo Gyustium (also known as "Agency of Industrial Science and Technology," Ministry of International Trade and Industry, Japanese Government), Tokyo-to, Japan

Filed Apr. 2, 1969, Ser. No. 812,817
Claims priority, application Japan, Apr. 6, 1968, 43/22393
Int. Cl. H04g 9/00, 11/00
U.S. Cl. 340—147 2 Claims



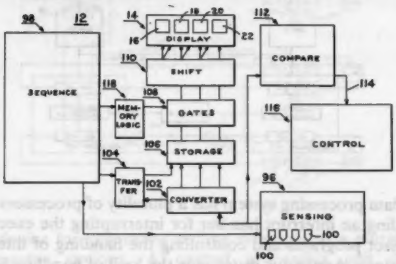
An input and output control system is disclosed including at least one channel and input-output devices which are connected by a set of interconnecting lines which include a data input bus adapted to transfer data from said input-output devices to said channel and a data output bus adapted to transfer data from said channel to said input-output devices. An improved system of a bus type connection system is defined in which connection of one channel and a plurality of input-output devices is attained by said set of interconnecting lines and said input-output devices is attained by said set of interconnecting lines and said input-output devices utilize one interconnecting line in time-divisional manner, said improved system being adapted to select one from among said several input-output devices said one having a request to be coupled with the channel. According to the improved system, it is therefore possible that the several input-output devices to be connected to the channel can impart the connecting requirement to the channel unit by utilizing the data input bus without providing signaling lines provided inherently on each of said devices, and that designation of any input-output device to be coupled can be attained by utilizing the data output bus without providing lines for designating connection of a required input-output device on the channel.

3,665,399

MONITORING AND DISPLAY SYSTEM FOR MULTI-STAGE COMPRESSOR

Richard M. Zehr, Tonawanda; James Mott, Buffalo, and Lawrence Schlimgen, Tonawanda, all of N.Y., assignors to Worthington Corporation, Harrison, N.J.

Filed Sept. 24, 1969, Ser. No. 860,768
Int. Cl. H04q 9/00; G06f 11/00
U.S. Cl. 340—152 R 53 Claims



A system is disclosed for sequentially monitoring and displaying the instantaneous value of a plurality of parameters associated with a motor driven device such as a multi-stage compressor. In addition to the basic functions of monitoring and displaying these values, the system performs a multitude of other functions such as: continuously comparing preselected ones of these parameters with pre-established reference signals to determine if these various parameters exceed predetermined safe limits; activating alarm devices should the particular parameters chosen exceed their pre-established limits; shutting down or otherwise controlling the device being monitored should the selected parameters exceed their predetermined levels so as to generate alarm signals; and storing the values of other preselected parameters such that these values can be subsequently displayed after the occurrence of an alarm situation. The system can be operated in a "scan" mode whereby the parameters are sequentially monitored, checked, and stored values updated at a preselected rate.

Alternatively, an operator can select a particular station to be monitored in which case the instantaneous value of that particular parameter will continuously be displayed by the system. Regardless of whether the system is operated in the "scan" or "hold" mode, the occurrence of an alarm condition in any of the pre-established parameters will generate appropriate command signals to shut down or otherwise control the device being monitored; while at the same time, the value of the parameter which generated the alarm signal will be displayed on the apparatus.

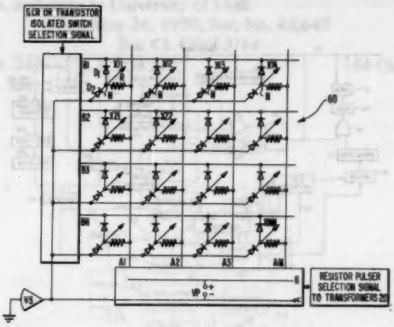
3,665,400

SWITCHING CIRCUITS AND METHOD FOR DIODE ELEMENTS IN CONDUCTOR SELECTION MATRICES

Donald D. Leuck, Toledo, Ohio, assignor to Owens-Illinois, Inc.

Filed Apr. 19, 1971, Ser. No. 135,021
Int. Cl. H04q 9/00
U.S. Cl. 340—166 R 9 Claims

A gas discharge display and memory panel having parallel row and parallel column conductor arrays wherein the conductors in the arrays are connected to selection and addressing resistor-diode matrix circuitry having non-inductive switch means for rendering nodal points in said matrix effective to change a discharge condition at selected sites of the panel. One embodiment discloses use of an SCR as the switch and another embodiment discloses a transistor switch.



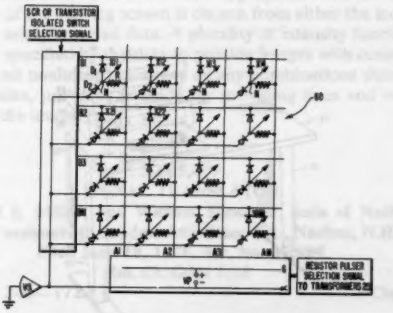
The circuits are reversible to accomodate negative and positive type pulses.

3,665,401

SWITCHING CIRCUITS AND METHOD FOR RESISTOR ELEMENTS IN CONDUCTOR SELECTION MATRICES

Leonard M. Budzynski, and Donald D. Leuck, both of Toledo, Ohio, assignors to Owens-Illinois Inc.

Filed Apr. 19, 1971, Ser. No. 135,023
Int. Cl. H04q 9/00
U.S. Cl. 340—166 R 4 Claims



A gas discharge display and memory panel having parallel row and parallel column conductor arrays wherein the conductors in the arrays are connected to selection and addressing resistor-diode matrix circuitry having non-inductive switch means for rendering nodal points in said matrix effective to change a discharge condition at selected sites of the panel. An NPN transistor switch is used to connect a high voltage source to the resistors in the matrices to thereby pulse the nodal points. The circuits are reversible to accomodate negative and positive type pulses.

3,665,402

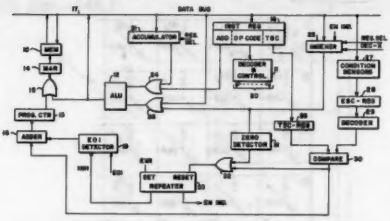
COMPUTER ADDRESSING APPARATUS

Lawrence E. Greenspan, Reeds Ferry, and Earl J. Whitaker, Amherst, both of N.H., assignors to Sanders Associates, Inc., Nashua, N.H.

Filed Feb. 16, 1970, Ser. No. 11,634
Int. Cl. G06f 9/20; G05b 1/01
U.S. Cl. 340—172.5 3 Claims

Operand list control apparatus for controlling the repeated execution of an instruction on a specified number of

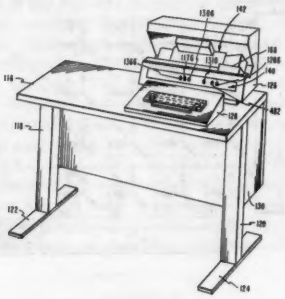
operands. The contents of an execution status register is updated at the conclusion of each execution of the instruction. The updated execution status field is then compared with a termination status field. On disagreement thereof, the repetitive execution of the instruction continues. However, upon agreement of the termination and execution status fields, the repetitive execution of the instruction is interrupted by returning control to the program addressing means.



3,665,403
DATA RECORDER AND VERIFIER

John J. Igel, Rochester, and Myron D. Schettl, Oronoco, both of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 1, 1970, Ser. No. 24,780
Int. Cl. G06k *5/00*; G06f *15/02*
U.S. Cl. 340—172.5 **15 Claims**

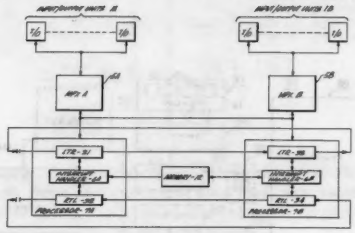


A data recorder for punching document cards which are of the type having three tiers into which encoded data may be punched, the system including a keyboard on which characters are entered serially, a magneto-strictive delay line constituting a storage device for storing encoded data from the keyboard in such serial form and circuitry for actuating punches from spaced characters in the storage device. The same machine may be used for verifying a previously punched document card utilizing the same keyboard as that for punching and includes circuitry by means of which program data may be entered into the data circulating through the delay line; and the recorder includes, in addition, circuitry for providing a right adjust function and for field or record erasing both under program control and in verify mode. Also, the machine includes circuitry for changing the data circulating through the delay line on verification to correct an error and repunching mechanism so that a corrected document card may then be made without any rekeying.

3,665,404
MULTI-PROCESSOR PROCESSING SYSTEM HAVING INTERPROCESSOR INTERRUPT APPARATUS

John R. Werner, Glendora, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Apr. 9, 1970, Ser. No. 26,944
Int. Cl. G06f *9/18*
U.S. Cl. 340—172.5 **11 Claims**

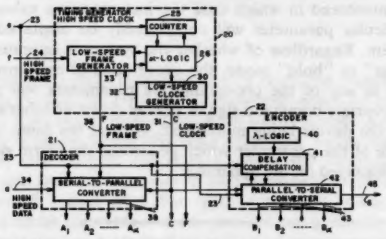


A data processing system has a plurality of processors each including an interrupt handler for interrupting the execution of object programs and controlling the handling of interrupt conditions. Apparatus distributes the load of handling a class of external interrupts between the processors on a dynamic priority basis. For example, if the processor having highest priority for handling the interrupt related to a particular input/output unit is busy handling an uninterruptable procedure or is otherwise unavailable when the input/output unit requires attention, the apparatus couples an interrupt transfer signal to the processor having the next highest priority and thereby enables the interrupt handler within that processor to service the input/output unit. Each processor within the system can include circuitry for generating transfer signals to enable any one of the processors to service each input/output unit.

3,665,405
MULTIPLEXER

Ray W. Sanders, Los Angeles; Neil T. Keyes, Palos Verdes, and William Quan, Los Angeles, all of Calif., assignors to Computer Transmission Corporation, Los Angeles, Calif.

Filed Mar. 17, 1970, Ser. No. 20,283
Int. Cl. G06f *5/06*
U.S. Cl. 340—172.5 **10 Claims**

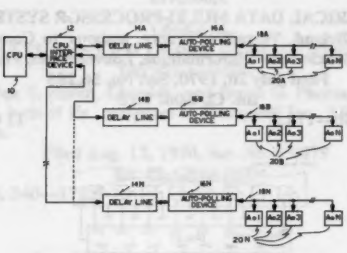


This invention involves a time division multiplex system designed particularly for use with data communication systems. The disclosure discloses a variety of interconnection systems by which a number of different data rate sources or utilization devices may be connected into a common transmission channel. It employs a number of data terminal transmission adapters which adjust the rate, compensate for delays and combine and interleave data in the manner which allows its ready separation and utilization at the opposite end of the transmission medium. The system employs a single master clock for the entire system. Disclosed is a variable data rate combiner which allows the combining of data rates related by the ratio of any two integers, thereby allowing great flexibility in system application.

3,665,406
AUTOMATIC POLLING SYSTEMS

Frank William Gallagher, Norwalk, and Richard C. Casey, Darien, bothof, Conn., assignors to The Bunker-Ramo Corporation, Stamford, Conn.

Filed Apr. 13, 1970, Ser. No. 27,877
Int. Cl. G06f 9/18
U.S. Cl. 340—172.5 22 Claims

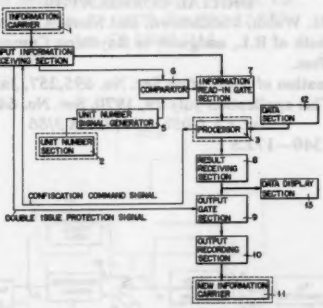


A device for generating polling messages to a plurality of addressable stations. A central processing unit (CPU) generates a polling table which is stored in an external automatic polling device. The polling device detects an address in the polling table and generates a polling message to the indicated station. The device receives responses to polling messages and tests to determine if they are positive or negative. A negative response causes a polling message to be sent to the station indicated by the next address in the polling table. A positive response causes an interrupt to the CPU which then receives the reply message. Interrupts to the CPU may also be generated when there is no response to a polling message, when there is an error response, or when the end of the polling table is reached.

3,665,407
AN AUTOMATIC PROCESSING SYSTEM FOR BOWLING GAMES

Satoshi Negishi, Yokohama, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed May 25, 1970, Ser. No. 40,089
Claims priority, application Japan, May 23, 1969, 44/39544
Int. Cl. G06f 3/06
U.S. Cl. 340—172.5 3 Claims

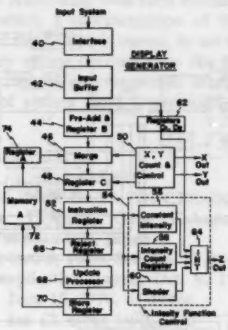


A processing system for bowling games which receives information carriers carrying prior bowling information for each participant. Progressing current bowling information is received and processed and a new information carrier carrying new updated information is produced after it is ascertained that the old information carrier is confiscated to prevent repeated use thereof.

3,665,408
ELECTRONICALLY-GENERATED PERSPECTIVE IMAGES

Alan C. Erdahl, and David C. Evans, both of Salt Lake City, Utah, assignors to University of Utah

Filed May 26, 1970, Ser. No. 40,647
Int. Cl. G06f 3/14
U.S. Cl. 340—172.5 54 Claims

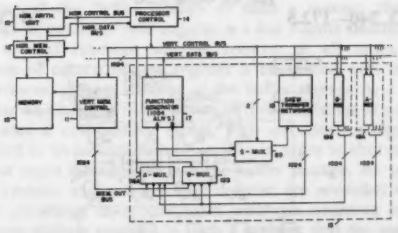


A method and system for generating point intensity control signals for producing complex images on an electronic display device. The image to be displayed is defined by data specifying bounded areas of the viewing screen of the display device together with an intensity function for that area. This data is fed in the order in which the bounded areas first appear in the scanning pattern of the display, utilized to generate point intensity control signals then updated for future use and stored in order. The appropriate data for each portion of the viewing screen is chosen from either the stored data or newly received data. A plurality of intensity functions may be specified by the data to provide images with constant linear and nonlinear intensities or any combinations thereof. In addition, provision is made for providing lines and overwriting the image.

3,665,409
SIGNAL TRANSLATOR

Howard S. Miller, and William Shooman, both of Nashua, N.H., assignors to Sanders Associates, Inc., Nashua, N.H.

Filed June 18, 1970, Ser. No. 47,404
Int. Cl. G06f 7/38
U.S. Cl. 340—172.5 7 Claims



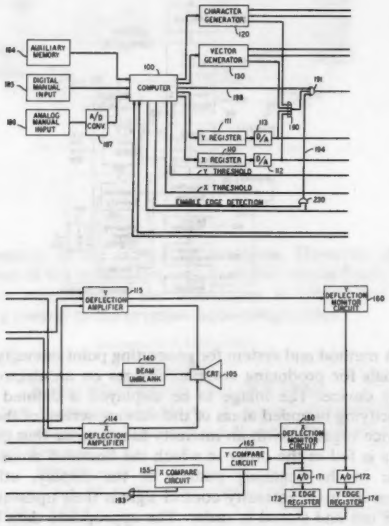
Signal translator for skew transfer or shifting of data from original data positions to remote positions. A number N of data bits is skew transferred or shifted in data position increments which are powers of the system radix, herein illustrated as two. A skew transfer network includes a routing net at each data position. The routing net at a particular data position receives data bits from data positions which are powers of two increments away therefrom. A control means responds to a skew distance code to provide timing signals to the routing nets so as to select the data bits corresponding to the specified shifting or skewing increment.

3,665,410

COMPUTER GRAPHICS SYSTEM WITH EDGE VIOLATION DETECTION

John Rickman Holland, Greensboro, N.C., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 13, 1970, Ser. No. 54,400
Int. Cl. H01j 29/70
U.S. Cl. 340—172.5 8 Claims



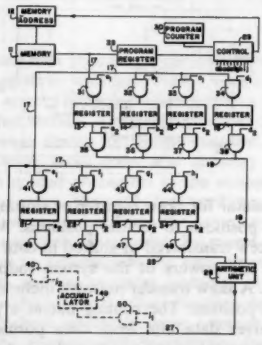
A computer graphics system is disclosed which includes means for detecting the attempted passing of a display boundary by a continuous portion of the visual entity to be displayed. This detecting means typically includes a comparator for generating a signal whenever the instantaneous deflection voltage exceeds a selectable threshold and a programmed data processor responsive to this signal for processing following display data.

3,665,411

COMPUTER

Daniel G. O'Connor, Endwell, N.Y., assignor to The Singer Company, New York, N.Y.

Filed June 8, 1970, Ser. No. 44,249
Int. Cl. G06f 7/38
U.S. Cl. 340—172.5 6 Claims



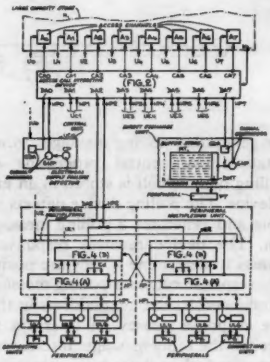
In normal digital computer operation each operation which is performed, normally requires a separate instruction. Time is required to obtain each instruction from storage and to decode each instruction. This invention comprises an improvement which provides means for performing several serial operations on several data words from different groups of words in response to a single instruction. This saves overall computer time, increases overall computer speed, and saves memory space.

3,665,412

NUMERICAL DATA MULTI-PROCESSOR SYSTEM

Roger H. Briand, Versailles, France, assignor to Compagnie Internationale Pour l'Informalique, Louveciennes, France

Filed July 20, 1970, Ser. No. 56,285
Int. Cl. G06f 9/18
U.S. Cl. 340—172.5 11 Claims



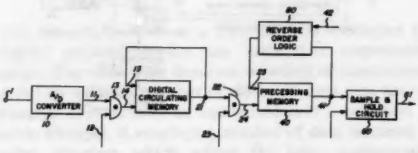
A numerical data processing system is disclosed which is comprised of a general large capacity information store and a plurality of processors selectively connectable to as many access channels of said store from the selective activation of as many store access calling lines. Part at least of said processors are provided with additional store access calling lines which are associated with hardware equipment for organizing a hierarchy of priority conflicting access calls from said processors to said store.

3,665,413

WAVEFORM REGENERATOR FOR USE WITH A DIGITAL CORRELATOR

George M. Walsh, Middletown, and Mark A. Chramiec, Newport, both of R.I., assignors to Raytheon Company, Lexington, Mass.

Continuation of application Ser. No. 695,257, Jan. 2, 1968.
This application July 29, 1970, Ser. No. 64,100
Int. Cl. G05b 1/01; G01s 3/86
U.S. Cl. 340—172.5 12 Claims



A waveform regenerator for use with a digital correlator having a first circulating memory and a second precessing circulating memory for storing and processing digital signal sequences. The apparatus comprises circuits responsive to each successive digital signal sample in the second memory for extracting the digital signal and reproducing each sample

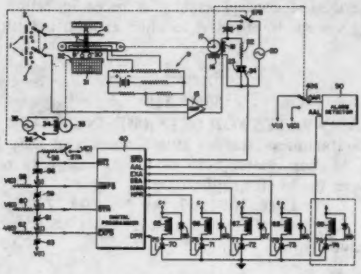
for a time interval equal to one circulating memory cycle. Reverse Order Logic is included in the second circulating memory for changing the order of succession of the digital signal samples. Means responsive to the contents of the first memory and the second memory replace the digital signal samples contained in the second memory by the digital signal samples stored in the first memory in the proper sequence to be extracted from the second precessing circulating memory.

3,665,414

MULTI-POINT RECORDER WITH SOLID STATE PROGRAMMER

Frederick S. Hutch, Glenside, and Bruce G. Phares, Philadelphia, both of Pa., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 12, 1970, Ser. No. 63,079
Int. Cl. G01d 9/00
U.S. Cl. 340—172.5 18 Claims



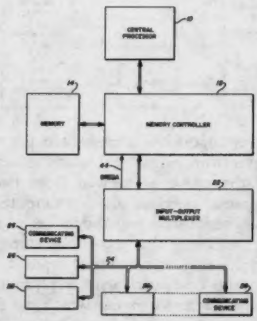
A multipoint recorder includes a solid state electronic digital programmer which includes a clock means for generating basic timing pulses which includes a clock means for generating basic timing pulses which are conditioned by a plurality of solid state circuits to operate the recorder in a predetermined operational sequence.

3,665,415

DATA PROCESSING SYSTEM WITH PROGRAM INTERRUPT PRIORITY APPARATUS UTILIZING WORKING STORE FOR MULTIPLEXING INTERRUPT REQUESTS

Albert L. Beard, and John C. Hunter, both of Phoenix, Ariz., assignors to Honeywell Information Systems, Inc.

Filed Apr. 29, 1970, Ser. No. 32,837
Int. Cl. G06f 9/18
U.S. Cl. 340—172.5 6 Claims



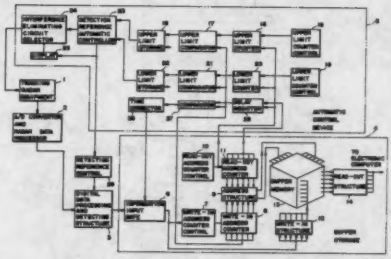
A data processing system having program interrupt apparatus with classes of interrupts for awarding priority to devices requesting service based in part on the relative priority of the device as a physical entity within the system and in part on the class or relative importance of the particular service requested by the device. Provision is made for storing a large number of interrupt requests in an interrupt multiplex table in working store. A representation of the relative importance of the service requested is supplied by the device in an interrupt level code and stored by enabling one of a plurality of bistables. Associated with each bistable is an area of system store in which a representation of the preassigned relative priority of the device is stored. In servicing interrupt requests a memory vector derived from the highest priority bistable and the highest representation stored in the corresponding area of system store is provided to the central processor.

3,665,416

ON-LINE REAL TIME DATA PROCESSING SYSTEM

Mitsuo Hikosaka, 1590-18, Oaza Kakura Kasuga-cho, Chikushi-gun, Fukuoka-ken, Japan

Filed Oct. 5, 1970, Ser. No. 77,860
Claims priority, application Japan, Oct. 9, 1969, 44/81005; June 10, 1970, 45/49464
Int. Cl. G06f 9/00, 3/00
U.S. Cl. 340—172.5 10 Claims



An on-line real time data processing system having a buffer storage and in which the flow of input information into the buffer storage is controlled in accordance with the amount of information stored in the buffer storage thereby to keep the amount of stored information at an optimum level for the entire system as well as to prevent saturation of the buffer storage with the input information. This data processing system is adapted especially for a radar track information processing system. A register is adapted to effect counting in synchronism with the counting of the readout address counter of the buffer storage in such a manner that the number of counts of said register is a few counts smaller than that of said read-out address counter at all times. The number of counts of said register is compared with that of the write-in address counter of the buffer storage by a comparator which, upon coincidence of those numbers of counts, generates a coincidence signal. This coincidence signal is supplied to an information input gate in order to shut off the flow of input information into the buffer storage. An upper-limit counter and a lower-limit counter are provided which effect countings in synchronism with the counting of the read-out address counter in such a manner that the number of counts of said upper-limit and lower-limit counters are, respectively, appropriate numbers of counts larger than that of said read-out address counter at all times. Those numbers of counts of said upper-limit and lower-limit counters are compared with that of said write-in address counter by an upper-limit comparator and a lower-limit comparator, respectively. These comparators generate coincidence signals upon coincidence of their numbers of counts and that of the write-in address counter. The coincidence signals are supplied to a detection-reference controller which, in response thereto, select the optimum detection reference in the track

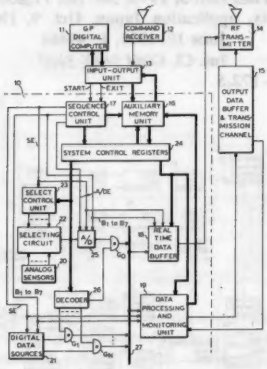
information detecting structure of the radar track information processing system so that an optimum amount of input information may be fed to the buffer storage. If the amount of information being supplied to the buffer storage falls beyond control of the detection-reference controller, an interference-eliminating circuit selector is actuated by the detection-reference controller to automatically select the optimum interference-eliminating circuit.

3,665,417

FLEXIBLE COMPUTER ACCESSED TELEMETRY

George M. Low, Acting Administrator of the National Aeronautics and Space Administration with respect to an invention of; Richard A. Easton, 1760 State Street 040, South Pasadena, Calif., and Edward E. Hilbert, 195 South Wilson Avenue, Pasadena, Calif.

Filed Feb. 19, 1971, Ser. No. 116,786
Int. Cl. G06f *5/06;* **H04l** *7/08*
U.S. Cl. 340—172.5 **12 Claims**



Flexible, computer-accessed telemetry is provided by a sequence control unit, auxiliary memory and system control registers to permit sensors and digital data sources to be sampled in a programmed format with various groups of samples taken at different rates. Each programmed sample may be processed for transmission in a specified way by including an operation code with the programmed address code used to select the designated sensor or digital data source. Index registers and a scratch pad memory permit flexibility in programming sample sequencing formats. A particular format may be started, stopped and altered by ground station commands received through a receiver, or directly by a digital computer.

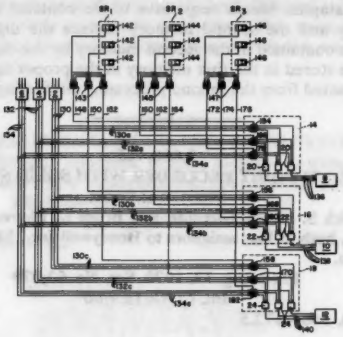
3,665,418

STATUS SWITCHING IN AN AUTOMATICALLY REPAIRED COMPUTER

Willard Gail Bouricius, Katonah, N.Y.; William Caswell Carter, Ridgefield, Conn.; John Paul Roth, Ossining, and Peter Robert Schneider, Peekskill, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed July 15, 1968, Ser. No. 744,888
Int. Cl. G06f *11/00, 11/08*
U.S. Cl. 340—172.5 **14 Claims**

Status switching means for an automatically repaired computer system of the stand-by redundancy type adapted to replace a failed component by a stand-by spare, characterized in that the switching means include separate selection or switch means associated with each data receiving device, respectively, so that there is no sharing of a given selection means between different receiving devices, whereby no selection means constitutes a "hard core" component the failure of which would interrupt computer operation. By the operation of encoded control means, a reconfiguration of the switching system is effected to shift around a faulty component.

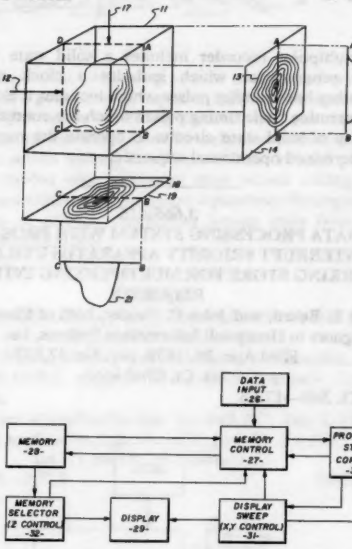


3,665,419

APPARATUS FOR DETERMINING SHAPE

Frederick Hartmann, Rolling Hills Estates, and Billy J. Huffmann, Mission Viejo, both of Calif., assignors to North American Rockwell Corporation

Filed Feb. 18, 1969, Ser. No. 800,222
Int. Cl. G11c *15/00, 5/02;* **G06f** *7/02*
U.S. Cl. 340—172.5 **17 Claims**

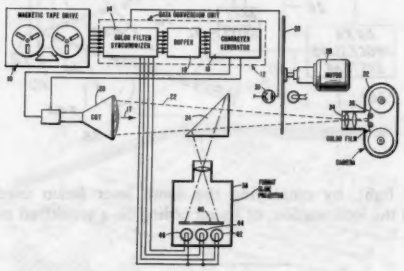


A superposition algorithm is presented for reconstruction of a closed curve from length and width values. That is, the "thickness" of the curve as viewed from two intersecting directions. A special purpose digital computer is described for automatically reconstructing the shape of closed curves. The computer performs the algorithm steps, displays the results and permits easy correction of input data. A memory is employed in the computer with a plurality of memory planes each in the form of a matrix which is a spatial analogy of a matrix in which a closed curve lies. The computer operates by an element by element scan of these matrixes, reading memory content, counting elements, or entering results as determined by the operating state of the computer.

3,665,420
COLOR PHOTOGRAPHY FROM CATHODE RAY TUBES AND OTHER RADIATING AREAS

James A. Somervell, Chevy Chase, Md., assignor to Micromation Systems Inc.

Filed Oct. 2, 1969, Ser. No. 863,296
Int. Cl. G06f *3/00*; G01d *9/42*
U.S. Cl. 340—172.5 15 Claims

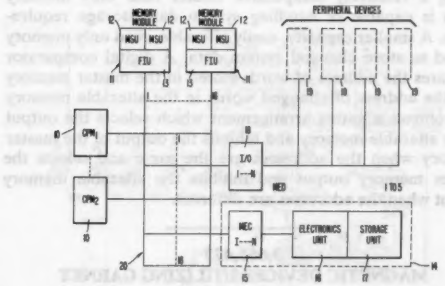


An improvement for data conversion apparatus which transforms magnetic tape into microfilm or which transforms any electrically transmittible code onto film. The improvement comprises an electronic synchronization and a rotating disc color filter insertion unit which, operating on command from special coding on the input media, causes the Cathode Ray Tube of the data display to be synchronized with the moving color filter so that selected portions of the displayed data can be photographed in color.

3,665,421
INFORMATION PROCESSING SYSTEM IMPLEMENTING PROGRAM STRUCTURES COMMON TO HIGHER LEVEL PROGRAM LANGUAGES

Frederick V. Rehhausser, Malvern; Elmer Dean Earnest, Dowingtown; Robert V. Bock, Malvern; Frederick H. Gerbstadt, Berwyn, and James J. Monek, Exton, all of Pa., assignors to Burroughs Corporation, Detroit, Mich.

Filed Nov. 28, 1969, Ser. No. 880,536
Int. Cl. G06f *15/16*
U.S. Cl. 340—172.5 10 Claims



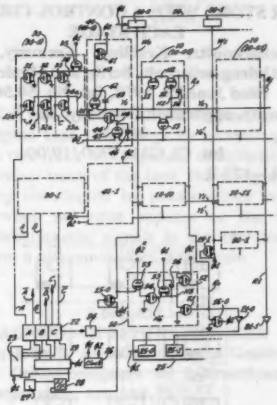
This disclosure relates to an information processing system adapted to implement functions common to many higher level programming languages which functions require information structures to be variable in length and size. Each processor in this multiprocessing system contains various structure buffers to manage different process or program structures that are nested to provide a hierarchy of processes and subprocesses. The structure buffers include resource stack buffers that reference resources available to a currently allocated process including a description of that process environment that in turn references control information for currently executed routines. Buffers are also provided to the various process name stacks that describe parameters and operands required and also for the value stacks which hold such operands.

The structure buffers are addressed through an associative memory to allow for the searching of the buffers for often used entries.

3,665,422
INTEGRATED CIRCUIT, RANDOM ACCESS MEMORY

Michael R. McCoy, San Jose, and Terry R. Walther, Sunnyvale, both of Calif., assignors to Electronic Arrays Inc., Mountain View, Calif.

Filed Jan. 26, 1970, Ser. No. 5,575
Int. Cl. G11c *11/40*; H03k *3/26*
U.S. Cl. 340—173 R 23 Claims



An integrated circuit MOS type memory is disclosed operating with two phases and minimum component cells. The cells are respectively located at intersections of a pair of two phase operated addressing lines and of a set of data write and read lines synchronously operated with addressing. Read addressing of cells in controlled concurrently with address decoding; write addressing of memory cells is dependent upon preceding read addressing of the same cells and concurs with preparation for the next addressing operation. Memory read lines are kept at floating potential prior to reading addressed cells which control the respective read lines to obtain node discharge or no-discharge in refresher amplifiers. Refresh write operations are controlled during the respective next write phase in dependence upon the charge contents of the nodes in the refresher amplifiers.

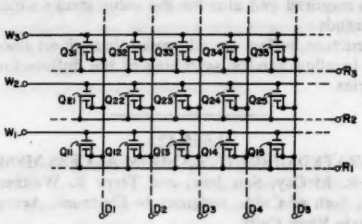
3,665,423
MEMORY MATRIX USING MIS SEMICONDUCTOR ELEMENT

Sho Nakanuma; Tohru Tsujide; Toshio Wada; Ryo Igarashi, and Katsuhiro Onoda, all of Tokyo, Japan, assignors to Nippon Electric Company, Ltd., Minato-ku, Tokyo, Japan

Filed Mar. 13, 1970, Ser. No. 19,217
Claims priority, application Japan, Mar. 15, 1969, 44/20670
Int. Cl. G11c *11/40*
U.S. Cl. 340—173 R 6 Claims

A memory matrix device is disclosed in which an MIS semiconductor element is employed as the memory element. The semiconductor element has an insulating film disposed

between the semiconductor substrate and conductor electrode. That film contains capture centers which capture electrons upon the application of a voltage exceeding a critical value across the electrode and substrate.

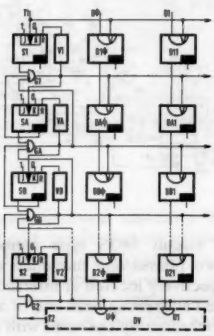


3,665,424

BUFFER STORE WITH A CONTROL CIRCUIT FOR EACH STAGE

Eckhart Scharkowitz, Krailling, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed June 29, 1970, Ser. No. 50,562
Claims priority, application Germany, July 3, 1969, P 19 33 907.2
Int. Cl. G11c 7/00, 19/00
U.S. Cl. 340—173 R 4 Claims



A buffer store employs a buffer control for advancing data through the buffer store until the data reaches the last or highest free data stage. The buffer control automatically advances the data by means of control stages which function as an internal clock to regenerate the clock pulse of the input apparatus, such as a computer, and the control stage of the last data stage empties the data content in accordance with the beat of the utilization apparatus, such as a magnetic tape system.

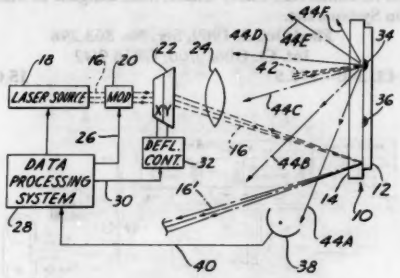
3,665,425

INFORMATION STORAGE SYSTEMS UTILIZING AMORPHOUS THIN FILMS

Julius Feinleib, Birmingham, Mich., assignor to Energy Conversion Devices, Inc., Troy, Mich.

Filed Mar. 9, 1970, Ser. No. 17,641
Int. Cl. G06f 3/00
U.S. Cl. 340—173 18 Claims

The system disclosed herein employs an amorphous semiconductor thin film which is switched between two stable states by applying a focused beam of laser energy. In one state the thin film exhibits specular reflection while in the other state it exhibits diffuse reflection. Data bits or images are recorded by the laser beam on the thin film. This information is retrieved by illuminating the thin film with collimated light, by employing the same laser beam used to record the information, or by recording on a sensitized medium.

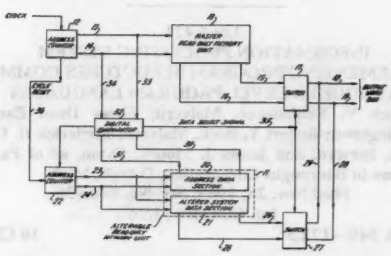


3,665,426

ALTERABLE READ ONLY MEMORY ORGANIZATION

Robert D. Gross, North Caldwell, and Roland T. Rogers, Wayne, both of N.J., assignors to The Singer Company, New York, N.Y.

Filed Oct. 7, 1970, Ser. No. 78,731
Int. Cl. G11c 29/00, 17/00
U.S. Cl. 340—173 SP 8 Claims



An alterable read only memory organization is provided having a relatively inexpensive master read only memory which is capable of handling system data storage requirements. A smaller capacity, easily alterable, read only memory is used to store changed system data. A digital comparator compares the address of words stored in the master memory with the address of changed words in the alterable memory and controls a gating arrangement which selects the output of the alterable memory and inhibits the output of the master memory when the addresses are the same and selects the master memory output and inhibits the alterable memory output when the addresses are different.

3,665,427

MAGNETIC DEVICES UTILIZING GARNET COMPOSITIONS

Andrew Henry Bobeck, Chatham; Richard Curry Sherwood, New Providence, and Le Grand Gerard Van Uitert, Morris Township, Morris County, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

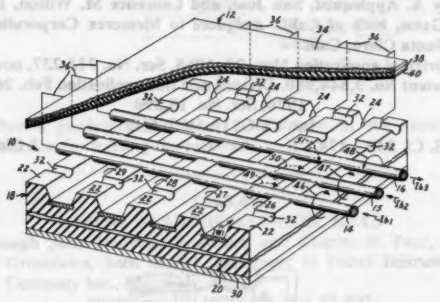
Filed Apr. 20, 1970, Ser. No. 30,060
Int. Cl. G11b 5/00
U.S. Cl. 340—174 TF 10 Claims

Rare earth iron garnet crystalline materials magnetic with compositions adjusted so as to lower magnetostriction in the <111> directions are advantageously incorporated in devices depending for their operation on "bubble" domains.

3,665,428
KEEPERED PLATED-WIRE MEMORY

Murray Olyphant, Jr., Lake Elmo; Michael David Cartier, North Saint Paul, and Charles Robert Freeman, Lincoln Twp., Washington City., all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 16, 1970, Ser. No. 81,285
Int. Cl. G11c 11/14, 5/02
U.S. Cl. 340—174 JA 6 Claims

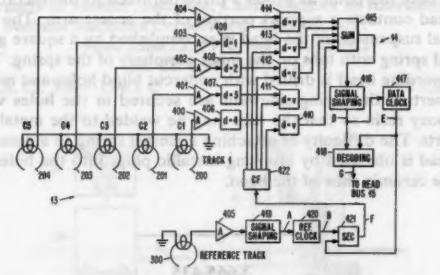


A plated-wire memory array, and a method of making the same, including a flexible integrally molded grooved keeper and word conductor combination having reinforcing material molded to the base of the keeper, plated bit wires in intimate contact with the keeper, and a ground plate.

3,665,429
RECORDED SIGNAL ENHANCING APPARATUS AND METHOD

Richard F. M. Thornley, Pine Brook Hills, Boulder, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 18, 1970, Ser. No. 73,288
Int. Cl. G11b 5/44, 5/26
U.S. Cl. 340—174.1 H 10 Claims

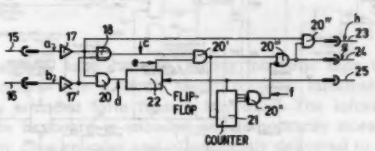


Previously recorded magnetizable spot indicia carried on a magnetic surface medium, are each repeatedly accessed for reading by a magnetic head transducer by relative motion of the surface and the head. Each time that the spot is read, the head supplies an output signal which is combined with previous and subsequent signals caused by repeated reading of the same spot. An enhanced signal, with a signal-to-noise ratio better than that normally obtainable, is formed by combining all output signals caused by repeated reading of a spot.

3,665,430
DIGITAL TAPE ERROR RECOGNITION METHOD UTILIZING COMPLEMENTARY INFORMATION

Kurt Hinrichs, and Gerd Wilken, both of Coburg, Germany, assignors to ERC Electronic Research Corporation, Basel, Switzerland

Filed Feb. 16, 1970, Ser. No. 11,805
Claims priority, application Germany, Feb. 18, 1969, P 19 08 060.5
Int. Cl. G11b 5/02; G06f 11/12
U.S. Cl. 340—174.1 H 1 Claim

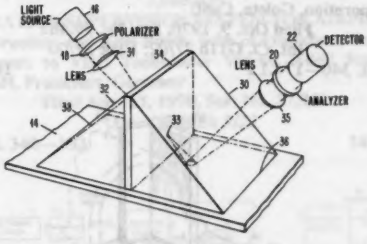


A method for recognizing errors appearing during the playback of digital tape recordings by recording the digital information on one track of a tape and complementary information on the other track of the tape, the complementary information being constituted by pulses which occur during every period when no pulse appears on the information track, and combining the signals in the two tracks during playback to form a reference clock pulse train.

3,665,431
MAGNETO-OPTIC TRANSDUCER

John K. Alstad; John D. Armitage, Jr., and Geoffrey Bate, all of Boulder, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 25, 1970, Ser. No. 49,758
Int. Cl. G11b 5/30
U.S. Cl. 340—174.1MO 9 Claims



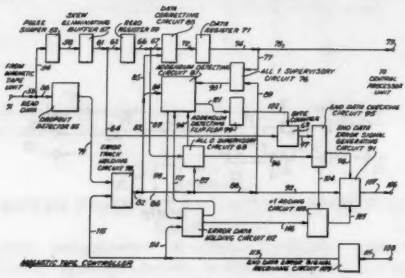
Disclosed herein is a new magneto-optic transducer which orients the transfer film non-parallel to the record storage medium with only an edge of the transfer film adjacent the record storage medium. The magneto-optic transducer also provides a reflecting surface adjacent the surface of the record storage medium on either side of the transfer film so that the magneto-optic Kerr or Faraday Effect may be utilized with the transducer. Furthermore, the reflecting surface permits a focused light beam to be directed near the edge of the transfer film adjacent the storage medium.

3,665,432

MAGNETIC TAPE UNIT READING SYSTEM

Takashi Kimura, Yokohama; Kazuo Kumagai, Kawasaki, and Kaoru Kanda, Yokahama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 24, 1970, Ser. No. 92,418
Claims priority, application Japan, Dec. 8, 1969, 44/98502; Dec. 23, 1969, 44/104017
Int. Cl. G11b 5/00, 27/36
U.S. Cl. 340—174.1 H 5 Claims



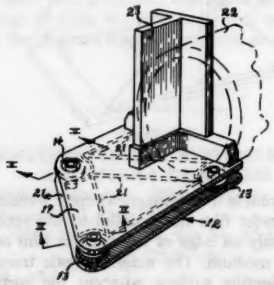
An all 0 byte detector detects from read data in a magnetic tape unit reading system a byte having data bits which are all 0. An all 1 byte detector detects from the read data a byte having data bits which are all 1. An addendum detector connected to the outputs of the all 0 byte detecting means and the all 1 byte detecting means detects all 0 and all 1 bytes as a virtual addendum to the read data by detecting the all 0 and all 1 bytes of the all 0 byte detector and the all 1 byte detector. A timer connected to an output of the addendum detector times a specific predetermined period of time starting with the detection of the data as a virtual addendum by the addendum detector. A byte counter connected to the timer counts the bytes of the read data. An end data checking circuit connected to the output of the byte counting means and to an output of the all 0 byte detector determines if an all 0 byte is detected by the all 0 byte detector during the specific period of time. An output is connected to the output of the end data checking circuit.

3,665,433

LINEAR POSITIONER FOR MAGNETIC TRANSDUCER

Daniel L. Gillum, Santa Barbara, and Donald E. Gillum, Goleta, both of Calif., assignors to Information Magnetics Corporation, Goleta, Calif.

Filed Oct. 9, 1970, Ser. No. 79,481
Int. Cl. G11b 21/02; F16c 21/00
U.S. Cl. 340—174.1 F 10 Claims



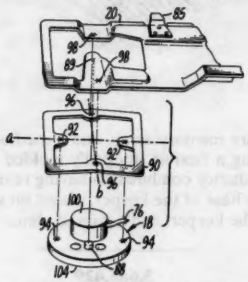
A carriage for moving read-write transducers for moving data media (discs, drums, tape, etc.) is designed for minimum friction of movement by having wheels with rims of circular cross-section that engage rails or grooves of circular cross-section, but with a different radius. Minimum mass is achieved by having the carriage body webbed and the spaces between the webs filled with an adherent lightweight material such as plastic foam. One of the carriage wheels is adjustable.

3,665,434

CERAMIC TRANSDUCER WITH METALLIC PLUGS TO FACILITATE MOUNTING

Roy A. Applequist, San Jose, and Laurence M. Wilson, Los Gatos, both of Calif., assignors to Memorex Corporation, Santa Clara, Calif.

Original application Mar. 22, 1968, Ser. No. 715,237, now Patent No. 3,544,980. Divided and this application Feb. 26, 1970, Ser. No. 18,390
Int. Cl. G11b 5/60, 5/42
U.S. Cl. 340—174.1 E 1 Claim



The recording head is in direct contact with the access arm at only the point at which a pivot pin fixed to the recording head contacts a support portion of the access arm. The actual suspension of the head is accomplished by a square gimbal spring with tabs on the inner periphery of the spring. The recording head is drilled with undercut blind holes and metal inserts with sloping sidewalls are secured in the holes with epoxy resin so that the tabs may be welded to the metal inserts. The difficulty of attaching a gimbal spring to a ceramic head is obviated by inserting metallic plugs into the holes in the ceramic shoe of the head.

3,665,435

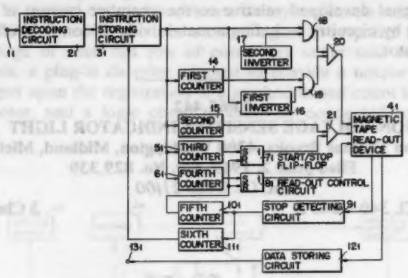
SYSTEM FOR CONTROLLING TAPE READ-OUT DEVICES

Tsutom Oya, and Kiyoshi Ebine, both of Tokyo, Japan, assignors to Japan Business Automation Co., Ltd., Tokyo and Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed May 11, 1970, Ser. No. 36,254
Claims priority, application Japan, May 12, 1969, 44/35785
Int. Cl. G11b 15/20
U.S. Cl. 340—174.1 B 4 Claims

A system for controlling tape read-out devices to read out data recorded on a tape in such a manner that the tape is first

driven in the direction opposite to the read-out direction and



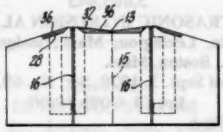
after a predetermined time it is driven in the read-out direction for starting the read-out.

3,665,436

LONG-WEARING MAGNETIC HEAD

Joseph John Murray, Nesconset, and Charles B. Pear, Jr., Greenlawn, both of N.Y., assignors to Potter Instrument Company Inc., Plainview, N.Y.

Filed June 17, 1970, Ser. No. 47,007
Int. Cl. G11b *5/22, 5/40*
U.S. Cl. 340—174.1 F **2 Claims**



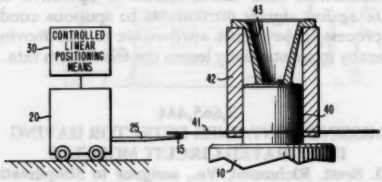
The specification and drawings disclose a long-wearing, multiple-track magnetic head in which a ceramic coating tapers to a feather edge that resists spalling and galling on each side of the transducer gap line.

3,665,437

METHOD FOR ALIGNING MAGNETIC HEADS FOR USE IN RECORDING A MASTER DISK PACK

Francis E. Mueller, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 22, 1970, Ser. No. 48,062
Int. Cl. G11b *5/46, 21/10*
U.S. Cl. 340—174.1 C **1 Claim**



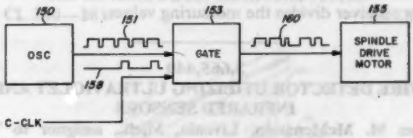
This invention discloses a method for aligning magnetic heads for use in recording a master disk pack. The steps comprise recording a signal for use in determining a reference track on each of a plurality of disks, assembling the disks on a hub so as to form a disk pack, and aligning a plurality of packwriting heads so that each head corresponds to the reference track.

3,665,438

APPARATUS FOR CONTROLLING TAPE SPEED

Kenneth E. Pope, Litchfield Park, Ariz., assignor to Cas, Inc., Phoenix, Ariz.

Filed Aug. 1, 1969, Ser. No. 846,779
Int. Cl. G11b *15/52;* **B65h** *25/12*
U.S. Cl. 340—174.1 A **3 Claims**



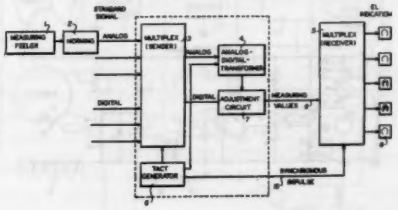
A magnetic tape cassette, having magnetic tape therein pre-recorded with a clock track, receives information in digitally encoded form from a keyboard. The information from the keyboard is encoded and temporarily stored in a magnetic core encoder and subsequently delivered to a shift register. The shift register applies the information to the cassette magnetic tape on a data track parallel to the clock track. Clock pulses are placed on the data track at the beginning of each bit cell to identify the bit cell boundary. The data clock and the data bit are written in concert with the pre-recorded clock track so that the data track on the cassette magnetic tape may be written and subsequently be read independent of the velocity considerations. The information thus recorded on the cassette magnetic tape is transferred to conventional computer tape by reading the data present in the data track and re-encoding the data to be temporarily stored in a buffer. The information thus stored is read onto the computer tape in the middle three tracks of the computer tape regardless of the number of tracks available on the computer tape. The information is read onto the computer tape such that each transverse bit position on the tape represents an encoded form of a single information bit rather than the encoded form of an information character. The magnetic tape cassette is mounted in a receiver that is hinged to permit removable engagement of cassette hubs with a spindle. The spindle is driven by an electric motor, the speed of which is controlled by applying electrical energy thereto from an oscillator through a gate; the gate is responsive to pulses from the pre-recorded clock track for controlling the drive motor velocity.

3,665,439

OPERATION SUPERVISION SYSTEM FOR AIRPLANES

Hans Brunner, and Karl Busch, both of Frankfurt, Germany, assignors to VDO Tachometer Werke, Adolf Schindling GmbH, Frankfurt, Germany

Filed Apr. 13, 1970, Ser. No. 27,869
Int. Cl. G08b *5/22*
U.S. Cl. 340—183 **14 Claims**



An operation supervision system for airplanes with a plurality of measuring feelers, which comprises means for transforming the measuring values into the form of electrical out-

put signals. Indication devices are coordinated to and are operable by the electrical output signals. Norming members follow the measuring feelers. A multiplex sender is operatively connected with the norming members, and senses cyclically the measuring values normed to standard signals and fed to an analog to digital converter. A multiplex receiver is connected with the output of the analog to digital converter by means of a transmission conduit, and quasi-analog electroluminescent display means are provided to which the multiplex receiver divides the measuring values.

3,665,440

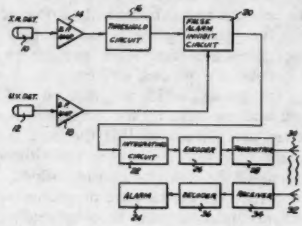
FIRE DETECTOR UTILIZING ULTRAVIOLET AND INFRARED SENSORS

James M. McMenamin, Livonia, Mich., assignor to Teeg Research, Inc., Detroit, Mich.

Filed Aug. 19, 1969, Ser. No. 851,221

Int. Cl. G08b *17/12*

U.S. Cl. 340—228.2 **8 Claims**



A fire detector consisting principally of a first radiation detector for detecting radiation in the infrared region of the spectrum and a second detector for detecting radiation in the ultraviolet region of the spectrum, connected to an alarm through a logic circuit. The logic circuit is adapted to set-off the alarm only if the infrared detector detects infrared radiation at a predetermined level in the flicker frequency range of a flame for a predetermined period of time in the absence of ultraviolet radiation at such flicker frequency detected by the ultraviolet detector.

3,665,441

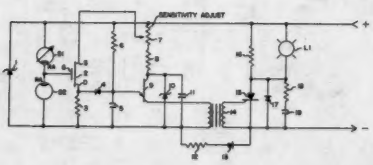
METHOD AND APPARATUS FOR DETECTING AEROSOLS

Michael Suchomel, Mountainside; William Tipton, Newark, both of N.J., and James H. Burnett, Wilton, Conn., assignors to General Signal Corporation, Rochester, N.Y. and Edwards Company, Inc., Norwalk, Conn.

Continuation of application Ser. No. 702,881, Feb. 5, 1968, now abandoned. This application Sept. 14, 1970, Ser. No. 72,103

Int. Cl. G08b *17/10*

U.S. Cl. 340—237 S **6 Claims**



Apparatus whereby the presence of aerosols in an atmosphere is detected by measuring the level of the ion current through a chamber open to the atmosphere, wherein an electric field impressed across the electrodes of the chamber is selected within a range of values maximizing the effect of aerosols on the level of the current through the chamber and the signal developed relative to the chamber current is detected by circuitry including a metal oxide silicon field effect transistor.

3,665,442

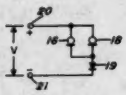
NON-VOLTAGE SENSITIVE INDICATOR LIGHT

William Thomas Brooks, 4300 Washington, Midland, Mich.

Filed June 2, 1969, Ser. No. 829,339

Int. Cl. G08b *21/00*

U.S. Cl. 340—248 R **3 Claims**



An indicator light unit comprising a field effect current regulator diode in series with a gallium arsenide phosphide diode (solid state light). This configuration when connected across a pair of terminals such as the firing circuit of an airborne rocket, will enable the detection of stray voltages on the terminals considerably below the normal firing voltage without damage to the light when the operating voltage is impressed.

3,665,443

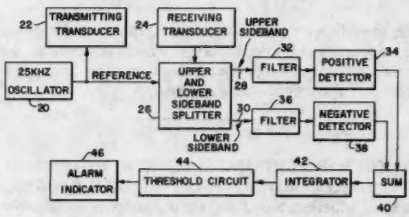
ULTRASONIC INTRUSION ALARM

Aaron A. Galvin, Lexington, Mass., assignor to Aerospace Research, Inc., Boston, Mass.

Filed Sept. 3, 1970, Ser. No. 69,306

Int. Cl. G08b *19/00*

U.S. Cl. 340—258 A **14 Claims**



An ultrasonic intrusion alarm system for detecting moving targets in a manner which effectively discriminates against interfering phenomena which could otherwise cause false alarm indications. The alarm system is operative to discriminate against signals attributable to spurious conditions and to process those signals attributable to true moving targets, thereby to substantially lessen the false alarm rate.

3,665,444

MISSING CONTAINER DETECTOR HAVING INTEGRATED CIRCUIT MODULES

Hugh D. Scott, Richmond, Va., assignor to Simplimatic Engineering Co., Lynchburg, Va.

Filed Dec. 28, 1970, Ser. No. 101,629

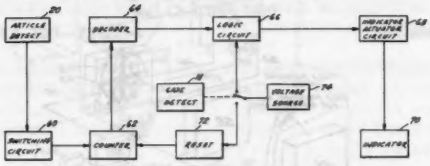
Int. Cl. G08b *21/00*

U.S. Cl. 340—259 **16 Claims**

A control apparatus for a missing container detector comprises a photoelectric cell mounted on a suitable frame at a control station along a conveyor belt for sensing the presence of a case at said control station, a plurality of container sensing heads, one for each lane, mounted above the conveyor belt and adapted to sense individual containers as they

pass thereunder, and a control circuit for indicating when a case is missing one or more containers.

The control circuit comprises a binary counter, a switching circuit adapted to produce a count signal in response to the passage of each full row of containers under said sensing heads, a plug-in decoder adapted to provide a unique logic output upon the registration of a predetermined count in said counter, and a logic circuit operatively connected to said



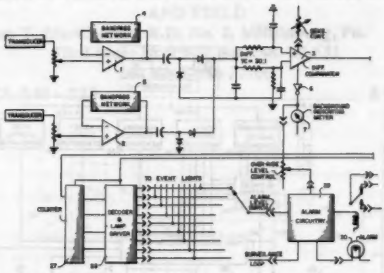
photoelectric cell and said decoder output and adapted as a case leaves said control station to actuate an indicating means in the absence of said unique output from said decoder. The indicating means may be an audible or visible alarm, means to eject a case, and/or means to stop the conveyor. The circuit utilizes exclusively solid state components and a variety of differently programmed plug-in decoders may be used thereby to adapt the circuit to cases having varying capacities.

3,665,445

DETECTION SYSTEM

Robert E. Riley, Jr., Jackson, Miss., assignor to Scientific Security Systems, Incorporated, Jackson, Miss.

Filed Dec. 22, 1970, Ser. No. 100,716
Int. Cl. G08b *19/00*
U.S. Cl. 340—261 **5 Claims**



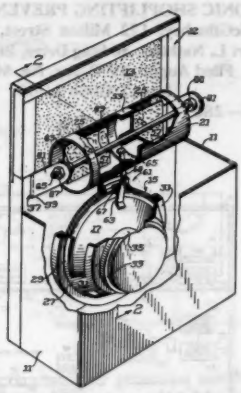
An intruder detection system wherein vibrations generated by an intruder are detected apart from normal environmental noise and are utilized to set off an alarm. The system detects activity rate rather than total generated energy by measuring duration, frequency and amplitude of generated sound. Detected vibrations having a predetermined frequency range provide an input signal for both legs of a differential amplifier. The output signal of the differential amplifier is analyzed for presence of characteristics typical for intruder-generated vibrations.

3,665,446

APPARATUS FOR SPEAKER ACTUATED VISUAL EFFECTS HAVING MECHANICAL DISPLAY ACTUATION

George C. Burm, Glendale Heights; Elmer C. Henriksen, Chicago, and Eugene V. Mateja, Norridge, all of Ill., assignors to Bell & Howell Company, Chicago, Ill.

Filed Jan. 18, 1971, Ser. No. 107,208
Int. Cl. G08b *21/00*; H01h *27/04*, *35/02*
U.S. Cl. 340—261 **16 Claims**



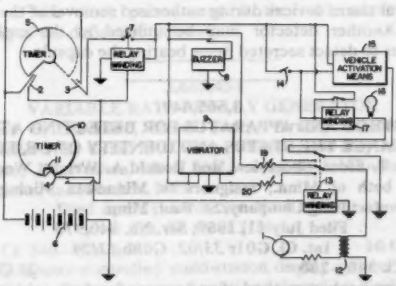
A permanent magnet speaker is mounted within an enclosure. The vibratory movements of the speaker cone are used to drive a translucent color cylinder which is positioned behind a viewing screen. A pair of incandescent bulbs are connected across the speaker coil and vary in intensity in accordance with the signal applied to the speaker. The screen displays a changing color pattern which varies in intensity with the audio signal.

3,665,447

METHOD AND APPARATUS FOR PREVENTING INEBRIATED PERSONS FROM OPERATING VEHICLES

Dennis P. Bidwell, 31 North Main St.; Douglas R. Davies, 4 Occum Ridge; John T. Hanley, Jr., 202 South Massachusetts Hall; William K. Hart, 102 Hitchcock Hall; Thomas A. Henderson, 114 French Hall; Thomas W. Lovell, 409 New Hampshire Hall, all of Hanover, N.H., and Lloyd C. Fogg, 2 Strafford Avenue, Durham, N.H.

Filed Dec. 5, 1969, Ser. No. 882,626
Int. Cl. G08b *21/00*
U.S. Cl. 340—279 **8 Claims**



A method and apparatus for preventing an inebriated person from operating a motor vehicle utilizing the flicker fusion

frequency phenomenon to identify the inebriate and automatically prevent him from operating the vehicle. The individual is exposed to a light source which randomly changes between an illumination which appears flashing to the sober individual and an illumination which appears steady. Means are provided to prevent operation of the vehicle until a signal from the individual and a signal representing the light change are received contemporaneously by said means.

3,665,448

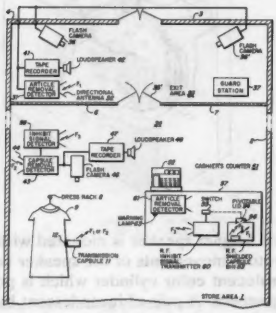
ELECTRONIC SHOPLIFTING PREVENTION SYSTEM

Hugh A. McGlinchey, 122 Milton Street, Waltham, Mass., and Robert L. Nathans, 36 Stag Drive, Billerica, Mass.

Filed Aug. 3, 1970, Ser. No. 60,593

Int. Cl. G08b *21/00*

U.S. Cl. 340—280 **30 Claims**



A system for preventing shoplifting of articles through a first exit area having an article removal detector positioned therein. A small capsule bearing the designation DON'T REMOVE ELECTRONIC ALARM is attached to an article to be protected, such as a dress, by means of a safety pin. The capsule includes a wristwatch battery which powers a single-stage, solid state oscillator which generates an RF signal having a frequency F_1 when the safety pin is closed. A shoplifter who passes through the exit area with the dress having the capsule fastened thereto will actuate an article removal detector which will in turn actuate a pair of flash cameras which are positioned to effectively photograph the entire exit area. If the shoplifter unfastens the safety pin in the process of discarding the radiating capsule within the store in an attempt to thwart the system, a capsule removal detector will immediately actuate a flash camera or annunciator to indicate unauthorized removal of the capsule. Upon payment of the dress, the cashier removes the capsule and very briefly causes an inhibit signal to be transmitted to the capsule removal detector to prevent activation of the capsule removal alarm devices during authorized removal of the capsule. Another detector may be utilized at the cashier's counter to detect secreted items bearing the capsule.

3,665,449

METHOD AND APPARATUS FOR DETECTING AT A DISTANCE THE STATUS AND IDENTITY OF OBJECTS

James T. Elder, Shoreview, and Donald A. Wright, Woodbury, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

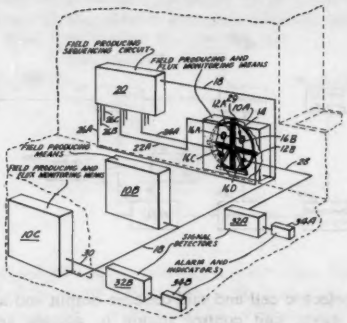
Filed July 11, 1969, Ser. No. 840,973

Int. Cl. G01r *33/02;* **G08b** *13/24*

U.S. Cl. 340—280 **23 Claims**

A non-contact method of and system for distinguishing the presence, identity or status of an object.

The system comprises a marker including a ferro-magnetic material to accompany each object to be detected, means for producing an alternating magnetic field within a zone through which the objects are to pass, means for monitoring magnetic flux changes within the zone and a circuit for detecting a flux change within the zone which corresponds to a signal characteristically produced by magnetization reversal of the marker ferro-magnetic material. The marker includes a relatively long, relatively thin, open-strip of a ferro-mag-



netic material and may include a remanently magnetizable control element to provide a sensitized and desensitized marker for demagnetized and magnetized states, respectively, of the control element. A plurality of magnetic field producing means are employed to produce in the zone magnetic fields of different orientations, virtually assuring production of a characteristic signal when a marker is passed into the zone.

3,665,450

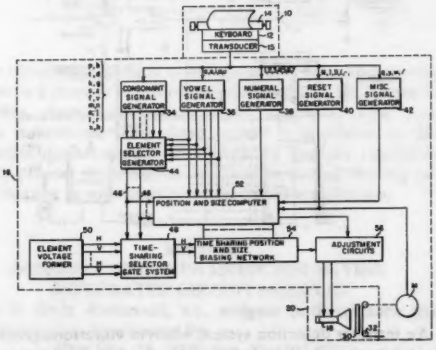
METHOD AND MEANS FOR ENCODING AND DECODING IDEOGRAPHIC CHARACTERS

Carl Leban, Lawrence, Kans., assignor to Leo Stanger, Summit, N.J., a part interest

Continuation-in-part of application Ser. No. 682,400, Nov. 13, 1967, now abandoned. This application July 2, 1968, Ser. No. 742,076

Int. Cl. G06k *15/20;* **B41b** *19/04*

U.S. Cl. 340—324 A **21 Claims**



Chinese language characters are transcribed by assigning coded digits such as letters or numerals to define first the gross form of each character on the basis of the arrangement of sections in the character, then to define the shapes of elements in each section, then to define the relative juxtaposition and cross over and enclosure and size differentiation of elements within each section; and by ordering the digits on

the basis of a predetermined sequence of element appearance within each section and on the basis of a predetermined sequence within sections. The thus transcribed characters can be numerically or alphabetically indexed. They can be used to select preset typing strokes that can be assembled into characters and thus form a Chinese language typewriter.

3,665,451

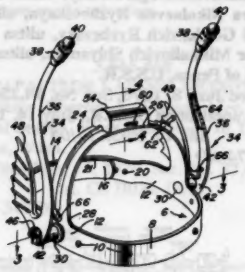
HEAD ATTACHED SAFETY LIGHT

Constant E. Keith, Rt. 3, Box 663, Theodore, Ala.

Filed Aug. 31, 1970, Ser. No. 68,339

Int. Cl. G08b *5/00*

U.S. Cl. 340—321 **4 Claims**



A head supported safety light device primarily for use when riding a bike, walking alongside a dimly lighted road or traversing a similarly dangerous area. It comprises a readily attachable harness embodying an adjustable head encircling strap suspended and held by a complemental bridle-like strap saddled over the wearer's head. An encased flashlight battery is perched atop the bridle-like strap and is cooperable with current conducting wires and a suitable switch. These wires are passed upwardly through tubular hingedly mounted arms which are ornamental, if desired, and which have socket members atop the elevated upper ends equipped with easy-to-see bulbs with or without built-in flashers.

3,665,452

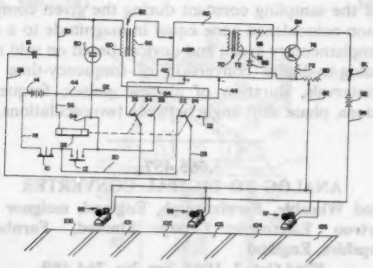
STARTING-TIMING DEVICE FOR SWIMMING, TRACK AND FIELD

William T. MacCreadie, R.D. No. 2, Mifflinburg, Pa.

Filed Mar. 16, 1970, Ser. No. 19,631

Int. Cl. G08b *21/00*

U.S. Cl. 340—323 **6 Claims**



A combination sound-flash system for starting races wherein a sound, indicating the start of the race, is produced through loudspeakers adjacent the racing lanes so that all contestant involved in the event receive the start signal simultaneously. Accompanying the sound is a flash produced by the system to permit accurate timing of the race from a distant point.

3,665,453

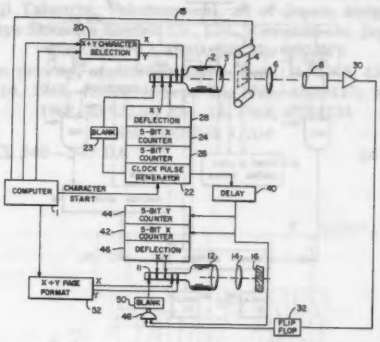
CHARACTER GENERATOR EMPLOYING PULSED BEAM INTERROGATION OF MATRIX

Asger T. Nielsen, San Diego, Calif., assignor to Compufoto, Inc., Wellesley Hills, Mass.

Filed June 1, 1970, Ser. No. 42,009

Int. Cl. G06f *3/14*

U.S. Cl. 340—324 A **7 Claims**



A cathode ray tube character generator suitable for computer output microfilming employs pulsed beam interrogation of a selected sector of a character matrix according to a predetermined pattern. There is shown a tube having a phosphor plate producing stationary light spots for effectively dissecting a character on a matrix transparency that is external of the tube. The pattern of stationary light pulses is produced with high speed phosphor and digitally implemented deflection system, with each stationary light spot being judged on a digital on or off basis. High quality character generation at suitable rates results. The system provides improved signal to noise ratio for the signal produced from the character matrix; e.g. with a cathode ray tube light source, the system decreases noise which is realized to be related to microscopic variations in the phosphor surface.

An implementation of the control system is shown as essentially a logic network, with transistor switching of various resistors in and out of the deflection coil circuit according to predetermined progression, with the light spot pattern being developed e.g., on a left to right, down, right to left down basis. Incremental shift of the deflection system from one setting to the next occurs with the beam blanked, and no change in setting occurs when the beam is unblanked.

A cathode ray tube system identical to the character generator is used as the display tube for the microfilm camera, both controlled by a master clock, with delay of the pulses to the display tube. In both systems the beam unblank pulses are correlated with the clock pulses, and the falling edge of the clock pulses controls the next incremented setting of the deflection network.

3,665,454

VARIABLE RATE DISPLAY GENERATOR

Robert D. Stoddard, Reeds Ferry; Arnold Schumacher, Cricket Hill; Grant W. Conley, Milford, and Roy M. Williams, Jr., Nashua, all of N.H., assignors to Sanders Associates, Inc., Nashua, N.H.

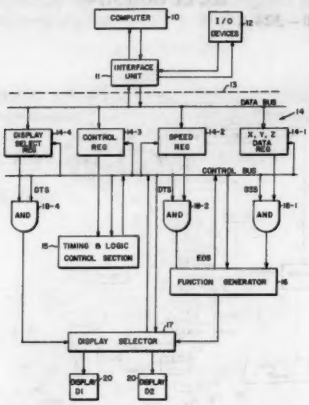
Filed Apr. 21, 1969, Ser. No. 818,015

Int. Cl. G06f *3/14*

U.S. Cl. 340—324 A **16 Claims**

A computer controlled multi-station display system utilizing a single display generator unit time shared by display indicators which have different writing rates. The display generator includes a register bank which receives and holds display indicator select and writing rate information as well

as symbol tracing information. A control section routes the display select information to a display selector and the writing rate and the symbol tracing information to a function generator which produces X, Y and Z axis modulating signals at a rate which corresponds to the writing rate information.



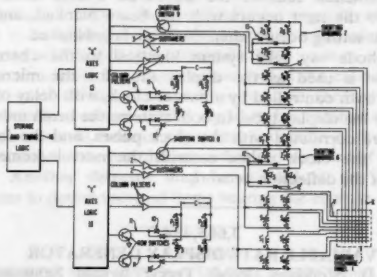
The display selector routes the generated X, Y and Z signals to a display indicator having a writing rate corresponding to the rate at which the X, Y and Z signals are produced. The function generator is illustrated as including a character generator having circuitry for varying rate at which characters are written on the display surface of the indicator.

3,665,455

BINARY ADDRESSABLE MAGNETICALLY MULTIPLEX DISCHARGE MANIPULATION SYSTEM FOR MULTIPLE GASEOUS DISCHARGE DISPLAY/MEMORY PANEL

Larry J. Schmersal; Joseph L. Mlavecz; Edward W. Pierce, and David S. Wojcik, all of Toledo, Ohio, assignors to Owens-Illinois, Inc.

Filed Sept. 1, 1970, Ser. No. 68,761
Int. Cl. H05b *41/24*; G08b *5/36*
U.S. Cl. 340—343 **4 Claims**



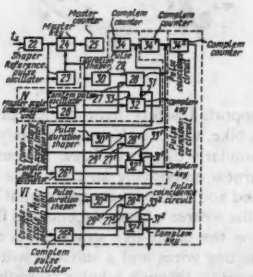
A binary addressable magnetically multiplexed system for selectively supplying discharge conditioning and discharge manipulating pulse potentials to row-column conductor pairs of a multiple gaseous discharge display/memory panel having a row-column conductor display/memory matrix wherein the conductors are non-conductively coupled to the gaseous medium in the panel. The panel discharge manipulation system is characterized by plurality of transformers, preferably of the printed circuit type wherein all of the windings of a set are printed on flexible board sheets and are the primary and secondary windings are layered. The transformers for selected groups of the row and column conductors, respectively are thereby magnetically coupled to multiple secondary windings which are electrically connected to the row and column conductors in the panel matrix. The system is further characterized by means for pulsing the primary windings including binary logic circuit means and means for selectively energizing select ones of the primary windings and their multiple secondary windings.

3,665,456

METHOD OF AND APPARATUS FOR ANALOG-TO-DIGITAL CONVERSION OF PHYSICAL VALUES AND THEIR RATIOS

Alexandr Alexandrovich Bogoroditsky, ulitsa Kranaya, 122, kv. 2.; Tamara Nikolaevna Ryzhevskaya, ulitsa Mira, 18, kv. 51; Alexei Gordeevich Ryzhevsky, ulitsa Mira, 18, kv. 51, and Viktor Mikhailovich Shlyandin, ulitsa Lermontova, 12, kv. 17, all of Penza, U.S.S.R.

Filed June 8, 1970, Ser. No. 44,256
Claims priority, application U.S.S.R., July 14, 1969, 1348411
Int. Cl. H03k *13/06*
U.S. Cl. 340—374 AD **7 Claims**



A method of analog-to-digital conversion of physical values and ratios thereof, consisting in that the value to be digitized is compared against a reference scale of standards based on the value of a divisor, and then several complementary scales are successively compared against the reference scale, each of the complementary scales being shifted relative to the reference scale by a value equal to the remainder left over as a result of the preceding comparison, the number of comparison operations being selected in accordance with the required accuracy of conversion, while the standards of the reference scale are presented in the course of each comparison as a sum of a coincidence zone equalling the required error of the sampling constant during the given comparison and a non-coincidence zone equal in magnitude to a respective complementary scale; and devices based on said method for analog-to-digital conversion of frequency-time signals (time intervals, duration of electric pulses, frequency of oscillations, phase shift angle between two oscillations, etc.).

3,665,457

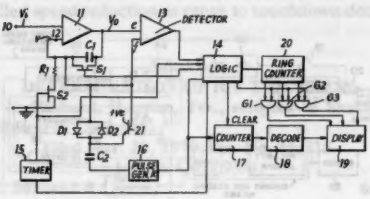
ANALOG TO DIGITAL CONVERTER

Desmond Wheable, Farnborough, England, assignor to The Solartron Electronic Group Limited, Farnborough, Hampshire, England

Filed Oct. 2, 1968, Ser. No. 764,489
Claims priority, application Great Britain, Oct. 4, 1967, 45,281/67
Int. Cl. G09b *13/00*
U.S. Cl. 340—347 NT **8 Claims**

A successive approximation type of analog to digital converter is disclosed which combines the advantages of high linearity, high precision and high speeds of digitization which

are characteristic of converters of this type, with certain important advantages which are characteristic of analog to



digital converters of the integrating type; specifically, good common or series mode rejection.

3,665,458

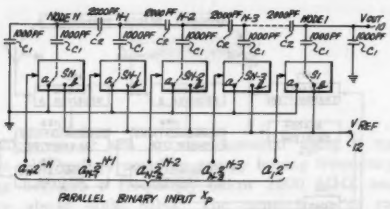
CAPACITOR LADDER NETWORK

Owen R. Mulkey; Charles A. Kleingartner, and Arnold A. Zoutte, all of Seattle, Wash., assignors to The Boeing Company, Seattle, Wash.

Filed May 14, 1970, Ser. No. 37,081

Int. Cl. H03k *13/02*

U.S. Cl. 340—347 DA **11 Claims**



A high speed digital to analog converter which utilizes capacitors. A capacitor ladder network in combination with switching means for selectively excluding individual ones of the capacitors from the network depending upon the parallel binary input signal information present is determinative of the analog output signal of the converter.

3,665,459

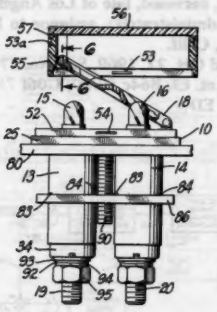
ANNUNCIATOR LIGHT HINGED COVER

James N. Dupree, South El Monte, and Frank A. Walker, Huntington Beach, both of Calif., assignors to Dupree, Inc., El Monte, Calif.

Filed Dec. 17, 1970, Ser. No. 98,979

Int. Cl. G09f *9/00*; B60q *3/04*

U.S. Cl. 340—381 **11 Claims**



A light housing for mounting in an instrument panel or the like and carrying a legend for illumination when lamps are energized. An annunciator light requiring small frontal panel space, while providing a maximum legend area and high intensity. In the housing one end of a plate is hinged to a removable front cap with the other end hinged to the housing providing access to lamps carried in sockets fixed in the housing.

3,665,460

DECODING SYSTEM

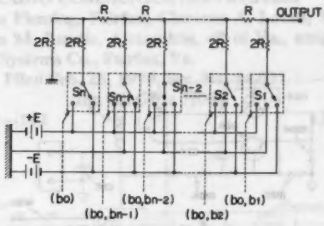
Junzo Murakami, Kawasaki-shi; Shigeo Asakawa, Tokyo, and Keiji Takeuchi, Yokohama-shi, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Sept. 22, 1969, Ser. No. 859,879

Claims priority, application Japan, Sept. 26, 1968, 43/69116; Nov. 14, 1968, 43/82854; Sept. 26, 1968, 43/69117; Nov. 20, 1968, 43/83226; Nov. 15, 1968, 43/84524

Int. Cl. H03k *13/04*

U.S. Cl. 340—347 DA **14 Claims**



A decoding system comprising a network including a plurality of signal supply terminals respectively corresponding to individual digits in the form of binary code, a signal source generating electric signals of three different values in response to the most significant digit and each corresponding digit, said electric signals being selectively applied to the corresponding signal supply terminals by means of switching circuits.

3,665,461

APPARATUS FOR MONITORING THE CONDUCTORS OR LINES OF FIRE ALARM INSTALLATIONS

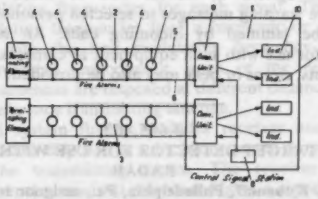
Alex Gnagi, Stafa, and Peter Muller, See, both of Switzerland, assignors to Cerberus AG, Mannedorf, Switzerland

Filed Sept. 10, 1970, Ser. No. 71,111

Claims priority, application Switzerland, Sept. 16, 1969, 13981/69

Int. Cl. G08b *29/00*

U.S. Cl. 340—409 **15 Claims**



An apparatus for supervising the continuity of the conductors of an alarm installation, especially a fire alarm installation, comprising a central signal station and a plurality of fire alarms each of which draws a quiescent current during normal operation and an alarm current when in an actuated condition. At least one pair of conductors electrically couples the fire alarms in parallel with one another and with such central signal station. A direct-current voltage supply is provided for the parallely connected fire alarms. Terminating element means serves to monitor the continuity of the con-

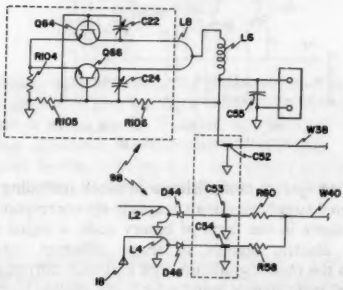
ductors, such terminating element means being connected across the ends of the conductors located remote from the central signal station and generates and applies to such conductors a signal containing at least an alternating-current component, said signal being distinguishable from the signal delivered by said direct-current voltage supply to said fire alarms and further being distinguishable from the quiescent and alarm current signals drawn by said fire alarms. Also, the central signal station is provided with means responding to the presence of the signal applied to the conductors by the terminating element means.

3,665,462

ALARM SYSTEM

William Joe Seaton, Kearns, and Arnold T. Pratt, Woods Cross, both of Utah, assignors to Garside Corporation, Salt Lake City, Utah

Filed Apr. 20, 1970, Ser. No. 29,977
Int. Cl. G01s 9/02
U.S. Cl. 343—5 PD **4 Claims**



An alarm system the operation of which is controlled by a key switch and, if desired, by a seven-button decoder. Several abnormality detecting devices are connected to a computer dialer. The detecting devices may consist of a wide variety of sensors, three types of which are mentioned in this specification. Upon receipt of an alarm signal from a detecting device, some of the computer dialer circuitry interrogates that signal and, as a function of that signal, actuates the proper output circuitry of the computer dialer. The output circuitry specifically comprises a two-track tape playback and telephone dialing equipment for use with a commercial telephone system to deliver one or more prerecorded telephone warning messages to selected persons. The system cannot be jammed by incoming calls. An alarm device adapter for use with such equipment as cameras, tape recorders, lights, sirens or bells may also be provided.

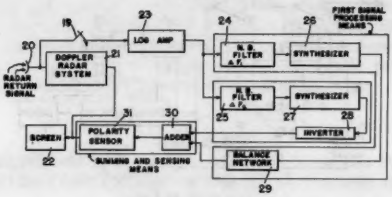
3,665,463

FIXED TARGET DETECTOR FOR USE WITH DOPPLER RADAR

Jacob H. Kubanoff, Philadelphia, Pa., assignor to The United States of America as represented by the Secretary of the Army

Filed Sept. 14, 1970, Ser. No. 71,817
Int. Cl. G01s 9/42
U.S. Cl. 343—5 R **16 Claims**

A return radar signal processing system which may be connected to existing doppler radar for detecting a stationary target or normally moving target which has stopped. The return radar signal is sampled in the clutter portion and moving target (or doppler) portion thereof, the noise energy in the clutter portion being compared with the noise scintillation products energy in the doppler portion. An unbalance or



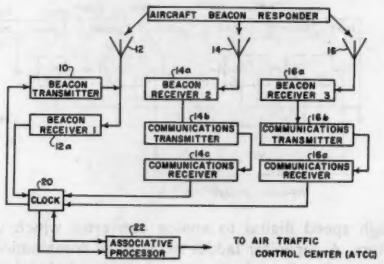
change in the ratio of these two energy levels is detected as a fixed target.

3,665,464

METHOD AND APPARATUS FOR HIGH SPEED VEHICLE POSITION ACQUISITION

Willard C. Meilander, Kent, Ohio, assignor to Goodyear Aerospace Corporation, Akron, Ohio

Filed May 1, 1969, Ser. No. 821,028
Int. Cl. G01s 9/56
U.S. Cl. 343—6.5 R **9 Claims**



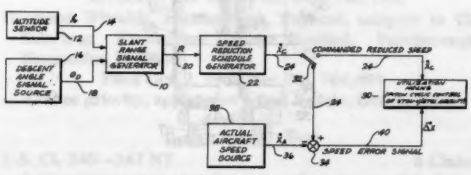
A transmitted interrogation and multiple receptions are utilized to provide aircraft position determination at high speed. A processing application of a data processor is utilized to implement the extensive data handling requirements of the system. The system may be ground based or is completely compatible with a navigational satellite or suitably equipped aircraft. Overlapped responses are substantially eliminated by discretely interrogating aircraft or other vehicles in accordance to distance.

3,665,465

DECELERATION SCHEDULE FOR AIRCRAFT LANDING

Justin G. Miller, deceased, late of Los Angeles, Calif. (by Rita Ann Miller, administratrix), assignor to Lear-Siegler, Inc., Santa Monica, Calif.

Filed Oct. 22, 1969, Ser. No. 870,008
Int. Cl. B64c 19/00; G06f 7/66
U.S. Cl. 343—7 ED **23 Claims**



An aircraft guidance system for generating a speed reduction schedule during deceleration along a known descent an-

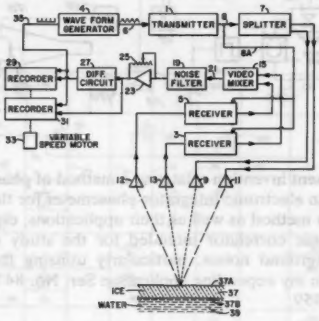
gle. Radar-sensed altitude along the descent angle is used to produce a signal representative of the aircraft's range to touchdown. The derived range signal is used to command a controlled speed reduction as range to touchdown decreases.

3,665,466

DETERMINATION OF ICE THICKNESS

Haines C. Hibbard, Houston, Tex., assignor to Esso Production Research Company

Filed Mar. 20, 1970, Ser. No. 21,325
Int. Cl. G01s *9/04*
U.S. Cl. 343—12 R **6 Claims**



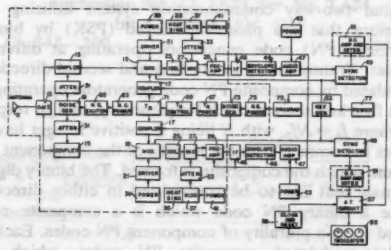
The thickness of sea ice is measured using a radar technique with radio frequency energy having frequency in the range between a frequency below 2000 MHZ and a frequency above 4000 MHZ. The penetration of radio frequency energy transmitted from above the ice and reflected by the ice or the water below it depends on the frequency of the energy. The frequency may be swept over the above range and the travel time of reflected energy recorded to obtain a measure of the salt concentration in ice.

3,665,467

CLEAR AIR TURBULENCE DETECTOR

George G. Haroules, Lexington; Wilfred E. Brown, III, Acton; Harold I. Ewen, Weston; Arthur E. Lilley, Belmont, and Ralph D. Kodis, Newton, all of Mass., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Nov. 19, 1969, Ser. No. 877,990
Int. Cl. G01w *1/00*
U.S. Cl. 343—100 ME **7 Claims**



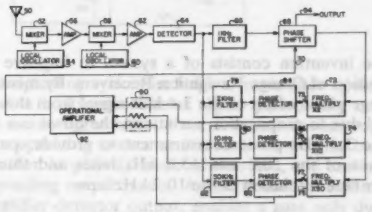
This disclosure describes an apparatus for warning the pilot of an aircraft of a region of clear air turbulence. A multi-channel radiometric sensor mounted on the aircraft detects both the ambient temperature of the air and any temperature anomaly that is present along the forward flight path. In those cases where temperature anomalies are associated with the presence of a clear air turbulence region, the invention provides means for remotely sensing these temperature anomalies through the application of a unique radiometric technique. By the detection of difference temperatures between a minimum of two channels, the invention provides a means for indicating the existence of a temperature anomaly indicative of clear air turbulence region. In addition, the distance from the aircraft to the anomalous temperature region is directly determined from the output indication of the radiometric sensor channels. The distance between the clear air turbulence region and the aircraft is determined by utilization of at least two observing frequencies which have known absorption coefficients of different values.

3,665,468

RADIO COMMUNICATION SYSTEM

James Evans Fleming, Fairfax; Clarence A. Lovell, McLean, and James M. Bandle, Alexandria, all of Va., assignors to Air Land Systems Co., Fairfax, Va.

Filed Feb. 25, 1970, Ser. No. 14,031
Int. Cl. G01s *1/08*
U.S. Cl. 343—102 **12 Claims**



A novel radio communication system is disclosed, the system having particular applicability and utility as a radio navigation aid. A transmitting means is utilized which, in the preferred inventive embodiment, comprises a plurality or array of antennas disposed in fixed spaced-apart relationship with one another at a known location. One of the transmitting antennas transmits a reference signal, preferably a carrier wave, modulated by a first frequency. The remaining transmitting antennas each transmits a single or double sideband suppressed carrier signal produced by respectively different modulating frequencies for each signal. These different modulating frequencies bear a harmonic or multiple relationship with the first modulating frequency. In the preferred inventive embodiment, each of the remaining transmitting antennas are disposed at different distances from the first or reference transmitting antenna.

The novel system further includes receiver and signal processing means disposed at a location remote from the location of the transmitting means. The receiver means generates from the received reference signal a signal having the frequency and phase of the first modulating signal at the transmitter. From this signal, the other modulating signals coherent with the first signal are derived. The receiver/signal processing means derives from the other received signals the second, third, and fourth modulating signals, and compares the phases of the signals of like frequency. The detected phase differences are indicative of the relative angular direction of the receiver from the transmitting array. In the preferred embodiment, the antennas of the transmitting array are disposed on a line and the phase difference detected in

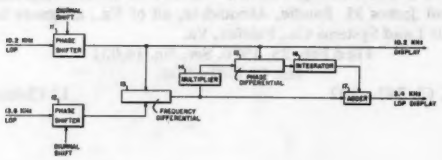
the receiver represents the angular deviation of the receiver from a plane bisecting and perpendicular to the line of transmitting antennas. The accuracy of the system is determined by the maximum spacing between a pair of antennas in the array. The other antennas are used only for resolving ambiguities.

3,665,469

APPARATUS FOR IMPROVING THE LANE RESOLUTION CAPABILITIES OF OMEGA NAVIGATION RECEIVERS

Melvin F. Williams, Washington, D.C., assignor to The United States of America as represented by the Secretary of the Navy

Filed Feb. 27, 1970, Ser. No. 14,913
Int. Cl. G01s *1/30*
U.S. Cl. 343—105 **4 Claims**



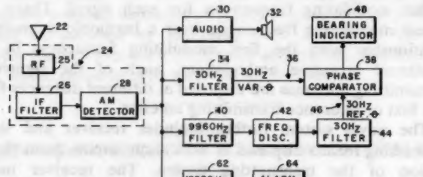
The invention consists of a system to improve the lane resolution of Omega Navigation Receivers. By measuring the average phase offset of the 3.4 kHz signal from the 10.2 kHz signal due to propagation variations, the offset can be added to the 3.4 kHz phase measurement to provide spatial coincidence of the 10.2 and 13.6 kHz lanes and thus provide better lane resolution of the 10.2 kHz lane.

3,665,470

MIST LINED VOR RECEIVER ALARM

William R. Hemme, Marion, Iowa, assignor to Collins Radio Company, Cedar Rapids, Iowa

Filed Aug. 7, 1970, Ser. No. 61,954
Int. Cl. G01s *1/50*
U.S. Cl. 343—106 R **9 Claims**



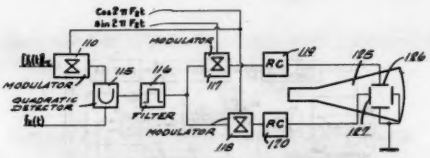
This invention relates to methods and apparatus for monitoring a frequency outside the standard VOR modulation spectrum to prevent reception of false information when a VOR receiver has been mistuned 50 kHz from the transmitting frequency of a desired ground station, and there is no actual ground station transmitting on the wrongly selected frequency.

3,665,471

METHOD OF INTEGRATION OF PHASE, INTEGRATOR-PHASEMETER AND THEIR APPLICATIONS

Robert Louis Gustave Laval, Chevilly-la-Rue, France, assignor to Societe Alsacienne De Constructions Mecaniques, Paris, France

Filed Oct. 20, 1959, Ser. No. 847,478
Claims priority, application France, Dec. 7, 1958, 778656
Int. Cl. G01s *5/02*
U.S. Cl. 343—112 R **3 Claims**



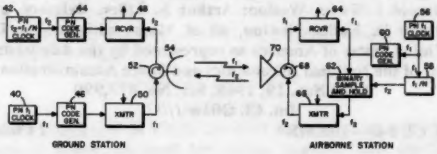
The present invention relates to a method of phase integration, and an electronic integrator-phasemeter for the application of this method as well as their applications, especially to an electronic correlator intended for the study of narrow band background noises, particularly utilizing the method disclosed in my copending application Ser. No. 847,477 filed Oct. 20, 1959.

3,665,472

TWO-WAY COMMUNICATION SYSTEM EMPLOYING TWO-CLOCK FREQUENCY PSEUDO-NOISE SIGNAL MODULATION

Earl M. Kartchner, Salt Lake City; Gary R. Van Horn, Granger, both of Utah, and Richard A. Wallace, Phoenix, Ariz., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Oct. 8, 1969, Ser. No. 864,596
Int. Cl. H04b *1/38*
U.S. Cl. 343—175 **3 Claims**



A digital two-way communication system utilizing RF transmissions that are phase-shift-keyed (PSK) by binary pseudo-noise (PN) code generators operating at different clock rates. Transmissions in the first and second directions are modulated by composite PN code generators operating at different first and second clock frequencies f_1 and f_2, respectively, where $f_1 = Nf_2$, with N being a positive integer having no factors in common with the lengths of the component PN codes from which the composite is formed. The binary digital data signals that are to be transmitted in either direction modulate a binary PN code which is a composite code generated from a plurality of component PN codes. Each of these data-modulated composite PN codes, which are generated at clock frequencies f_1 and f_2, respectively, modulates, in turn, an RF carrier signal.

By having the two communication stations transmit and receive at different PN clock frequencies, equipment limita-

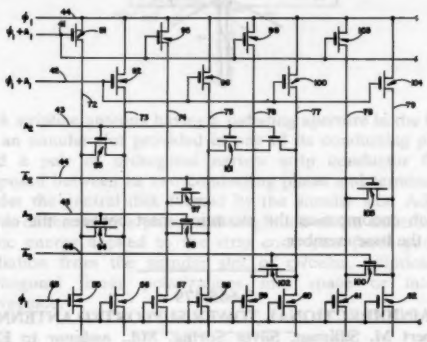
tions that restrict transmitter performance in the second direction need not limit performance in the first direction, thereby allowing a higher clock frequency f_1, in the first direction and subsequent lower power required at the receiver at the other end for the same SNR out of the receiver.

3,665,473

ADDRESS DECODE LOGIC FOR A SEMICONDUCTOR MEMORY

Gary Lee Heimbigner, Anaheim, Calif., assignor to North American Rockwell Corporation

Filed Dec. 18, 1970, Ser. No. 99,440
Int. Cl. G11c 7/00; H03k 19/34, 19/168
U.S. Cl. 340—166 FE **3 Claims**



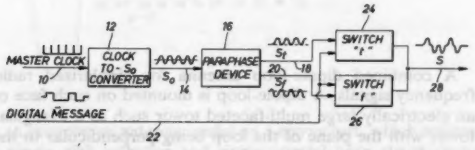
One address line of a related pair of address lines implementing address decode logic for a semiconductor memory provides an electrical ground discharge path for itself and the adjacent address line of the related pair when neither line is addressed. When one line of the related pair of address lines is addressed, the unaddressed line is converted to an electrical ground line and the addressed line remains charged. The related pairs of address lines provide decode logic for addresses differing at only one bit position (X, X). The different bit positions are implemented by field effect transistors used in precharging the address lines and in evaluating the address input signals.

3,665,474

HIGH DENSITY COMMUNICATIONS SYSTEM

Olin E. Thayer, Houston, Tex., assignor to Amscat Corporation, Houston, Tex.

Original application Aug. 19, 1966, Ser. No. 573,632, now Patent No. 3,497,618, dated Feb. 24, 1971. Divided and this application Jan. 12, 1970, Ser. No. 7,424
Int. Cl. H04b 1/04, 1/16
U.S. Cl. 343—200 **11 Claims**



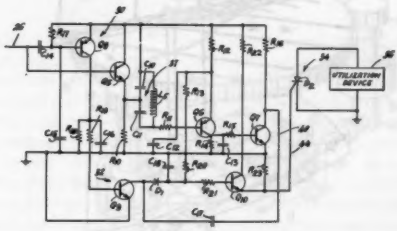
Binary data is encoded in sinusoidal form. Two complementry sine waves at the binary data frequency are generated; one is positively biased, the other is negatively biased. The binary data selectively gates each sine wave. At the receiver, a zero dc level sine wave is recovered and clock pulses are derived from the peaks of the recovered wave. One binary level is produced when a clock pulse coincides with a positive peak of the incoming sinusoid; the other binary level is produced when a clock pulse coincides with a negative peak of the incoming sinusoid.

3,665,475

RADIO SIGNAL INITIATED REMOTE SWITCHING SYSTEM

Herbert R. Gram, Madison, Conn., assignor to Transcience, Inc., Stamford, Conn.

Filed Apr. 20, 1970, Ser. No. 29,949
Int. Cl. H04b 7/00
U.S. Cl. 343—225 **4 Claims**



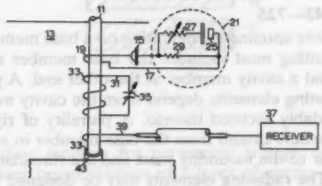
A radio signalling system includes a transmitter operating to transmit a continuous carrier signal periodically modulated with a tone signal burst. A receiver includes an amplifier-detector operating to recover the audio tone signal bursts, which are then amplified, threshold detected, and converted to corresponding output pulses. A discriminator, responding to the amplifier-detector output, enables a gate only during the intervals between tone signal bursts when unmodulated carrier is received. The output pulses are passed by the enabled gate and accumulated to ultimately effect triggering of switching means to initiate a remote switching function. Energization of the transmitter is achieved by selectively positioning a pivotally mounted battery to make an electrical contact between a battery terminal and a stationary terminal contact.

3,665,476

ANTENNA

Allen R. Taylor, Nutley, N.J., assignor to the Singer Company, New York, N.Y.

Filed Dec. 1, 1965, Ser. No. 510,808
Int. Cl. H01q 1/26
U.S. Cl. 343—701 **1 Claim**



A receiving antenna for submarines wherein tunnel diodes are inductively coupled to a plurality of ferrite rod by a

coupling link. The tunnel diodes are back-biased by a biasing circuit to establish operation in the negative resistance region. Bias current and coupling are adjusted to provide cancellation of the major portion of the ferrite core losses and copper losses of the main turning winding.

3,665,477

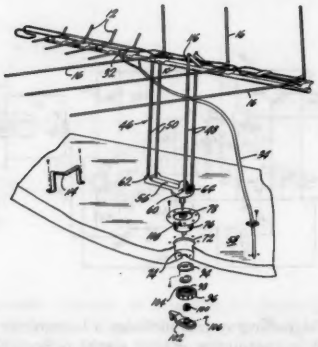
ELEVATABLE AND FOLDABLE ANTENNA

Jack C. Budrow, and Glenn A. Reed, both of Battle Creek, Mich., assignors to Barker Manufacturing Co., Inc., Battle Creek, Mich.

Continuation-in-part of application Ser. No. 789,834, Jan. 8, 1969, now Patent No. 3,587,104. This application July 30, 1970, Ser. No. 59,604

Int. Cl. H01q *3/02*

U.S. Cl. 343—714 **13 Claims**



An antenna having dipole signal receiving elements pivotally mounted on an antenna body supported upon a parallelogram linkage connected to a rotatable base member. The dipole elements are capable of pivoting between open and closed positions, and the parallelogram linkage includes operating means for raising the antenna body from a retracted position to an elevated position, and the linkage is connected to the dipoles such that the dipoles are automatically positioned to the open signal receiving position upon the antenna body being elevated, and are pivoted to a closed position in general alignment with the antenna body in the retracted position.

3,665,478

FOLDABLE ANTENNA OPERABLE IN DUAL MODES

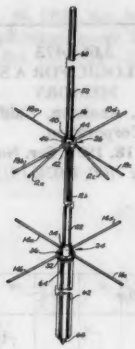
Richard C. Dempsey, 9718 Quartz Ave., Chatsworth, Calif.

Filed Aug. 31, 1970, Ser. No. 68,132

Int. Cl. H01q *21/00*

U.S. Cl. 343—725 **3 Claims**

A foldable antenna for mounting on a base member. A vertical mounting mast includes the base member at one end thereof and a cavity member at the other end. A plurality of rigid radiating elements depend from the cavity member and are threadably secured thereto. A plurality of rigid ground plane members extend from the base member in a plane perpendicular to the mounting mast and are threadably secured thereto. The radiating elements may be designed to transmit and receive circularly polarized waves. Further, the cavity may have a monopole radiating element threadably secured thereto in a plane parallel to the plane of the mounting mast and a second set of ground plane elements operatively associated with the monopole radiating element threadably secured to the cavity in a plane perpendicular to the mast. The radiating elements and the ground plane elements may be removed and transported in a carrying case member



which encompasses the mounting mast between the cavity and the base member.

3,665,479

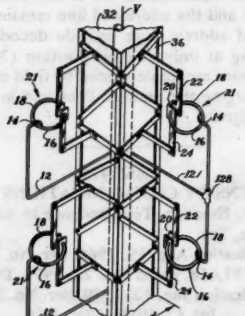
OMNIDIRECTIONAL TOWER SUPPORTED ANTENNA

Robert M. Silliman, Silver Spring, Md., assignor to Electronics Research, Inc., Evansville, Ind.

Filed July 28, 1970, Ser. No. 58,975

Int. Cl. H01q *21/00*

U.S. Cl. 343—726 **9 Claims**

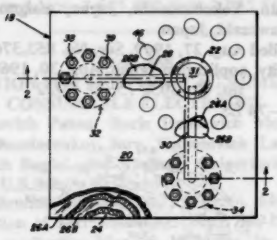


A combined dipole-loop antenna for bipolarized radio frequency signals. A dipole-loop is mounted on each face of an electrically large multi-faceted tower such as a triangular tower with the plane of the loop being perpendicular to the axis of the tower and transverse to the face plane of the tower with the dipole portion extending above and below the loop and parallel to the vertical axis with the loop portion encircling the transmission line and the dipole portion facing the tower.

3,665,480
ANNULAR SLOT ANTENNA WITH STRIPLINE FEED

Matthew Fassett, Billerica, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Jan. 23, 1969, Ser. No. 793,266
Int. Cl. H01q 3/26
U.S. Cl. 343—754 15 Claims

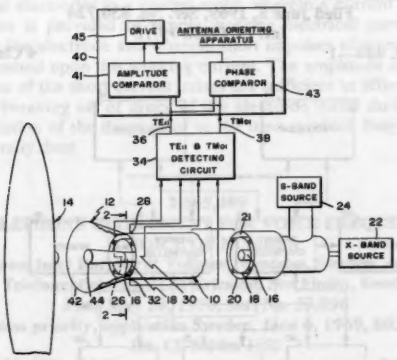


A stripline antenna having a radiating aperture in the form of an annular slot provided in one of its conducting plates and a pair of orthogonal narrow strip conductor feeds disposed between its two conducting plates and terminating under the central disk formed by the annular slot. Adjustment of the relative phase and amplitude of the electromagnetic energy applied to the strip conductor feeds permits radiation from the annular slot of circular, elliptical or orthogonal linear polarizations into space or into a waveguide.

3,665,481
MULTI-PURPOSE ANTENNA EMPLOYING DISH REFLECTOR WITH PLURAL COAXIAL HORN FEEDS

George M. Low, Deputy Administrator of the National Aeronautics and Space Administration with respect to the application of, and Kenneth E. Woo, 1621 Amberwood Dr., South Pasadena, Calif.

Filed May 12, 1970, Ser. No. 36,531
Int. Cl. H01q 19/14
U.S. Cl. 343—762 7 Claims

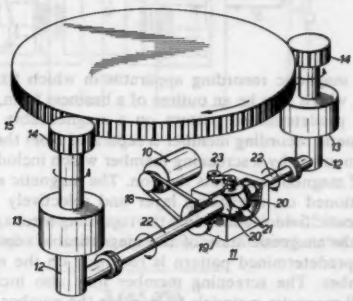


A microwave antenna useful on a spacecraft, which utilizes a single dish reflector and single coaxial horn structure to transmit at two frequencies, and to receive signals at a third frequency that allow tracking. The horn structure includes a coaxial wave-guide with an inner pipe for transmitting X-band waves, an intermediate pipe, surrounding the inner pipe for transmitting S-band waves through the space between it and the inner pipe, and an outer pipe surrounding the intermediate pipe for receiving S-band tracking signals. An outer horn flares from the outer pipe and an inner horn flares from the inner pipe, to efficiently illuminate the dish reflector at both X and S bands.

3,665,482
TRACKING ANTENNA WITH ANTI-BACKLASH SPRING IN GEAR TRAIN

Richard Cresswell, Essex, England, assignor to The Marconi Company Limited, London, England

Filed Mar. 10, 1971, Ser. No. 122,807
Claims priority, application Great Britain, Mar. 13, 1970, 12,079/70
Int. Cl. H01q 3/00
U.S. Cl. 343—765 5 Claims

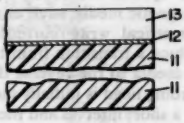


A steerable aerial, driven via a differential and two reduction gearboxes, on which backlash is eliminated by a spring biassing arrangement. The spring biassing arrangement is connected between the cage member of the differential and one of the planet gears of the differential and provides a constant torque spring bias to one of the reduction gearboxes in relation to that of the other.

3,665,483
LASER RECORDING MEDIUM

Carl H. Becker; Harold R. Dell, both of Palo Alto; Keith E. McFarland, Woodside, and Herman Wong, Santa Clara, all of Calif., assignors to Chase Manhattan Capital Corporation, New York, N.Y.

Filed June 6, 1969, Ser. No. 831,172
Int. Cl. G01d 15/34
U.S. Cl. 346—1 13 Claims

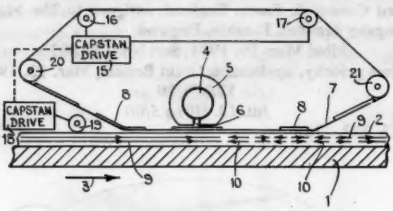


A recording medium for permanent storage of data by selective laser beam ablation of a layer of energy-absorbing material. The recording medium is formed by a substrate, a uniform layer of light energy-absorbing material coated on the substrate, and a protective layer of transparent material coated over the layer of energy-absorbing material. The protective layer and substrate seal the respective sides of the layer of energy-absorbing material.

3,665,484
MAGNETIC RECORDING SYSTEMS

Alan Foster, Hitchin, England, assignor to International Computers Limited, London, England

Filed July 30, 1970, Ser. No. 59,613
Claims priority, application Great Britain, July 30, 1969, 38,139/69
Int. Cl. G06k *19/00, 19/06;* G11b *5/80*
U.S. Cl. 346—74 MP 4 Claims

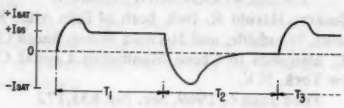


A magnetic recording apparatus in which fixed information, which may be an outline of a business form, is recorded as a predetermined pattern on a magnetizable member. A magnetic recording member is separated from the magnetizable member by a screening member which includes a plurality of magnetic elements thereon. The magnetic elements are positioned on a backing layer and selectively prevent the magnetic field produced by the recording means from changing the magnetic state of the magnetizable member so that the predetermined pattern is recorded on the magnetizable member. The screening member may also include further small magnetic materials to increase the number of magnetic fringe fields which will allow a more uniform change of state of areas of the magnetizable member.

3,665,485
METHOD AND SYSTEM FOR HIGH DENSITY RECORDING OF INFORMATION ON PREMAGNETIZED MAGNETIC TAPE

Charles B. Pear, Jr., Greenlawn, N.Y., assignor to Potter Instrument Company, Inc., Plainview, N.Y.

Filed June 11, 1969, Ser. No. 832,316
Int. Cl. G11b *5/06*
U.S. Cl. 346—74 M 13 Claims

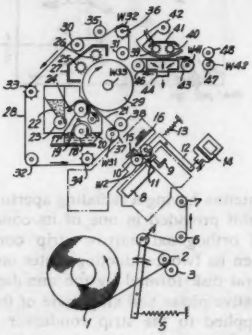


A method and system for recording information on a premagnetized magnetic media, such as a magnetic tape, employs an unsymmetrical write current wave form. When recording to produce a transition from the direction of magnetization of the media to the reverse direction, the current through the recording head is initially increased to a relatively large value for a short interval and then reduced to a lesser value, comprising respectively an overdrive or step pulse of relatively high current amplitude followed by a pedestal level, or lower amplitude of recording current is maintained until the next transition is recorded. When recording a transition from the now established opposite direction of magnetization to that of the premagnetized direction, the recording current is initially increased to a large value, but of opposite polarity, for a short interval, comprising a return step pulse, after which the current is reduced to zero until the next transition is recorded. There results high recording densities wherein the recorded transitions may be read with high resolution and without undesirable interference, the reading of both switching and return transitions with either forward or reverse motion of the tape producing output pulses of substantially identical shape and of substantially identical timing.

3,665,486
ELECTROSTATIC RECORDING APPARATUS FOR HIGH SPEED OPERATION

Tadakazu Sato, Yokohama-shi, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Aug. 27, 1969, Ser. No. 853,376
Claims priority, application Japan, Aug. 30, 1968, 43/63483
Int. Cl. G03g *15/00, 15/22*
U.S. Cl. 346—74 ES 2 Claims

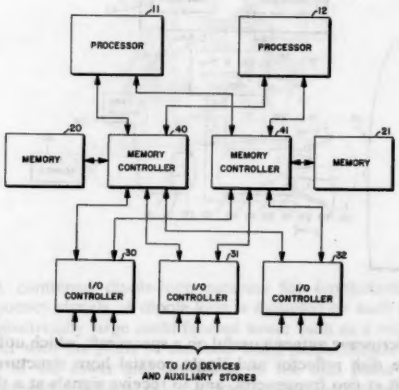


An electrostatic recorder as driven at a specific low speed to record information on a continuous sheet of recording paper. A developer and fixer is simultaneously driven at a specific high speed to develop and fix recorded information on the recording paper after the recorded paper is cut upon passing through the recorder.

3,665,487
STORAGE STRUCTURE FOR MANAGEMENT CONTROL SUBSYSTEM IN MULTIPROGRAMMED DATA PROCESSING SYSTEM

Donald J. Campbell, Lansdale; William J. Heffner, Robesonia, both of Pa.; Paul H. Jennings, Mesa, and Jane E. King, Sun City, both of Ariz., assignors to Honeywell Information Systems Inc.

Filed June 5, 1969, Ser. No. 830,724
Int. Cl. G05b *19/18*
U.S. Cl. 444—1 4 Claims



A management control subsystem for a multiprogrammed data processing system, wherein large amounts of virtual

working storage are provided for chains of operating system programs performing services for user programs without substantially reducing the real working storage space available for other user programs.

ERRATA

For Classes 13—9 thru 346—74 M see:
Patent Nos. 3,665,488 thru 3,665,513

3,665,488

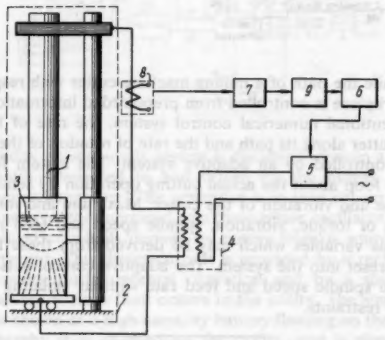
INSTALLATION FOR ELECTROSLAG REMELTING OF CONSUMABLE ELECTRODES

Boris Evgentevich Paton; Boris Izrailevich Medovar; Oleg Petrovich Bondarenko; Jury Vadimovich Latash; Vitaly Mikhailovich Baglai, and Vladimir Grigorievich Shirshov, all of Kiev, U.S.S.R.

Original application June 8, 1967, Ser. No. 644,719, which is a continuation of Ser. No. 64,825, Aug. 18, 1970. Divided and this application Mar. 10, 1970, Ser. No. 23,112

Int. Cl. H05b *3/60*

U.S. Cl. 13—9 **8 Claims**



An installation for the electroslag remelting of consumable metal electrodes in a cooled mold, wherein a current supply means is provided to supply working electrical current to melt the electrode and wherein short impulses of current are impressed upon this working current. The amplitude and duration of the short current pulses are sufficient to effect positive breaking off of drops of the electrode metal during the formation of the drops prior to the time at which they would naturally drop.

3,665,489

TELEPHONE INSTRUMENT FOR VOICE FREQUENCY CHOICE OF NUMBER

Herman Josef Burghardt Vollmer, Vendsiso, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

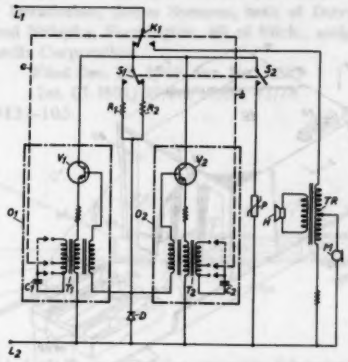
Filed May 20, 1970, Ser. No. 39,096

Claims priority, application Sweden, June 6, 1969, 8033/69

Int. Cl. H04m *1/50*

U.S. Cl. 179—90 K **2 Claims**

There is disclosed a voice frequency oscillator included in a telephone instrument for voice frequency signalling, wherein the frequency of the oscillator can be set to predetermined values by the influence of certain contacts. The oscillator includes a circuit which in calling state is connected in series with the line loop of the telephone instrument. This circuit determines, by voltage dividing, the operating point of the oscillator. The circuit comprises two parallel branches with different impedance values, which by a make-and-break contact can be alternatively connected to the line loop for providing two different values of current passing through the line for signalling two different states.



3,665,490

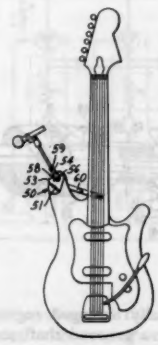
MICROPHONE ATTACHMENT FOR GUITARS AND SIMILAR STRINGED INSTRUMENTS

John Raymond Oskar, Crooks, S. Dak., assignor to Mike-Master, Inc., Sioux Falls, S. Dak.

Continuation-in-part of application Ser. No. 868,011, Oct. 21, 1969, now abandoned. This application Apr. 1, 1970, Ser. No. 24,494

Int. Cl. H04m *1/04*

U.S. Cl. 179—146 R **6 Claims**

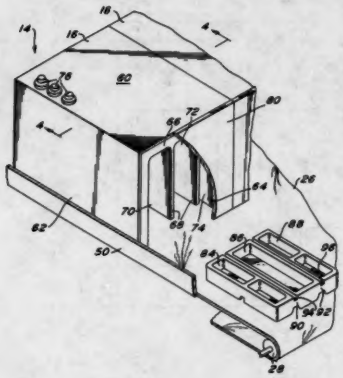


Guitars and similar plucked-string instruments are provided with a microphone-holding attachment at a corner adjacent the neck of the instrument. This frees a singer-player from dependence on a stationary microphone.

3,665,491
FOOD HEATING DEVICE

Willard Cooper, 379 Burwood Ave., Camden, N.J.

Filed Feb. 17, 1971, Ser. No. 116,094
Int. Cl. H05b 9/06
U.S. Cl. 219—10.55 8 Claims

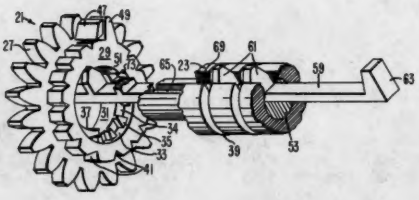


A microwave oven divided into a plurality of zones. Each zone is operative to generate a different quantity of heat energy. Food trays are provided. The trays are divided into a plurality of compartments. Each compartment is adapted to be aligned with one of the oven zones so that food disposed in that tray compartment is heated to a desired temperature.

3,665,492
REGISTERING MEANS PROVIDING SIMULTANEOUS STORAGE AND TRANSFER OF SEPARATE AMOUNTS

Osias Feldman, Paris, France, assignor to Burroughs Corporation, Detroit, Mich.

Filed Sept. 24, 1970, Ser. No. 75,026
Claims priority, application France, Mar. 6, 1970, 7008178
Int. Cl. G06c 9/00
U.S. Cl. 235—60 MT 18 Claims

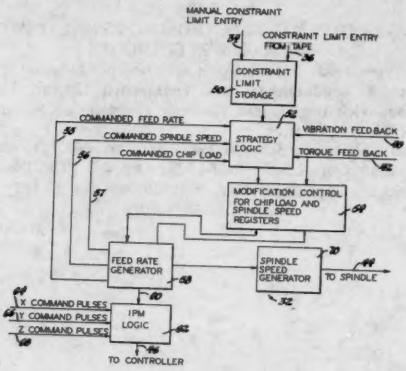


A plurality of ordinally arranged registering wheels are rotatably supported on a grooved shaft and are each comprised of a pinion member and a cooperating ring member, the pinion member being rotatable in unison with the ring member to thereby store a first amount, and rotatable independently of the ring member to transfer a second amount as between extraneous amount releasing and receiving means. Means are provided both for selectively recalling the stored amount from the ring members, while still retaining such amount thereon, and for either clearing the stored amount or substituting a different amount therefor.

3,665,493
ADAPTIVE NUMERICAL CONTROL SYSTEM FOR A MACHINE TOOL

Thomas L. Glowzewski, Warren, and Hymie Cutler, Detroit, both of Mich., assignors to The Bendix Corporation

Filed Mar. 30, 1970, Ser. No. 23,698
Int. Cl. G05b 13/02
U.S. Cl. 235—151.11 15 Claims

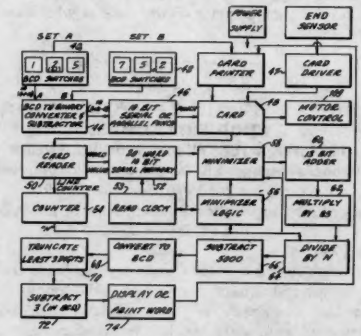


While the path of a milling machine cutter with respect to a workpiece is controlled from prerecorded information by a conventional numerical control system, the rate of feed of the cutter along its path and the rate of rotation of the cutter are controlled by an adaptive system. The system forms a servo loop about the actual cutting operation by sensing the torque and vibration of the cutter. Maximum and minimum limits of torque, vibration, spindle speed and feed rate, as well as variables which may be derived from these factors, are preset into the system. The adaptive control acts to optimize spindle speed and feed rate without violating any of these restraints.

3,665,494
GOLF COMPUTER

Joseph Baumoel, Jericho, L. I., N.Y., assignor to Controlotron Corporation, Farmingdale, L. I., N.Y.

Filed Mar. 2, 1970, Ser. No. 15,549
Int. Cl. G05b 1/00; G06f 7/38; G06k 1/02
U.S. Cl. 235—156 8 Claims



The unit computes the handicap of a golfer from information corresponding to golf score and course rating entered on

a punchcard. The machine performs its function by reading the information stored on the card and by using solid-state and electro mechanical devices to derive the handicap defined by the United States Golf Association. This handicap may then be permanently recorded on the punchcard and may additionally actuate a display panel. One embodiment of the invention provides the handicap by direct computation, while a second embodiment establishes the handicap by comparison with a memory table. Each arrangement, however, affords the advantages of almost instant computation, and with equal accuracy to that obtainable through pencil and paper computation.

3,665,495

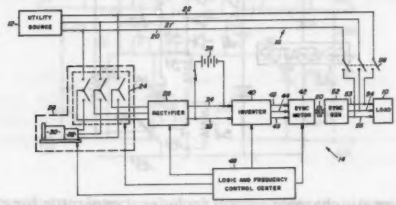
NO BREAK POWER SYSTEM

Robert Carter, Richmond; Ralph A. Amos, Bon Aire, and Charles A. Gregory, Jr., Richmond, all of Va., assignors to Power Systems and Controls, Incorporated, Richmond, Va.

Filed June 1, 1970, Ser. No. 42,041

Int. Cl. H02j *9/00*

U.S. Cl. 307—67 **8 Claims**



A standby power supply system is disclosed wherein a load is normally connected to and driven by the output of a synchronous generator. The generator is in turn driven by a synchronous motor energized by a three-phase oscillator controlled inverter which derives its power from a source of direct current. This direct current is provided by a rectified utility source during normal operation and by a standby power source when a fault occurs in the utility. The standby source is shown as a high capacity battery floating on the DC line, whereby it is charged by the utility, and is also immediately available for standby operation. The inverter oscillator is controlled to maintain phase and frequency synchronization between the load power and the utility during normal operation, but becomes free running during standby.

3,665,496

ELECTRICAL SIGNAL SAMPLING DEVICE

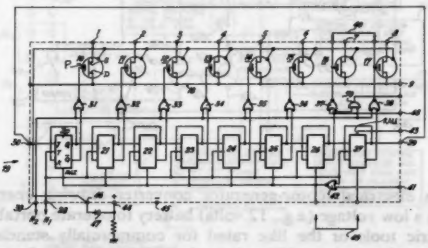
Jacques Donjon, Paris, France, assignor to Societe de Fabrication d'Instruments de Mesure (S.F.I.M.), Massy, France

Filed May 20, 1970, Ser. No. 39,690

Claims priority, application France, May 23, 1969, 6916900

Int. Cl. H03k *17/00*

U.S. Cl. 307—251 **5 Claims**



In a sampling device for receiving simultaneously several electrical signals at different inputs and successively sampling them in predetermined order, there is provided a priming gate for each input, the priming gates being controlled in succession by a ring counter such that the samples taken from each input appear in succession at a single output.

3,665,497

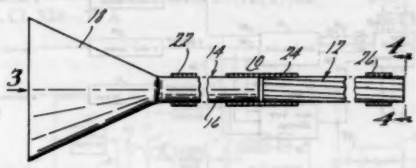
ELECTRON MULTIPLIER WITH PREAMPLIFIER

Bagdasar Deradorian; James Svenson, both of Detroit, and Raymond Nalepka, Farmington, all of Mich., assignors to The Bendix Corporation

Filed Dec. 18, 1969, Ser. No. 3,589

Int. Cl. H01j *39/16, 43/04, 43/18*

U.S. Cl. 313—103 **5 Claims**



A spiraled electron multiplier assembly fabricated of six twisted channels fused into a solid bundle or array, the input section of the electron multiplier being provided with a flared input section formed of a straight channel portion and a flared input portion integrally formed therewith. The input section is assembled with a spiraled multiplier section by means of a collar-like or tab-like electrode for establishing a voltage potential at the output section of the flared section and the input to the multiplier section, the flared input section being slightly spaced from the spiraled electron multiplier.

3,665,498

SYSTEM FOR THREE-PHASE INDUCTION MOTOR

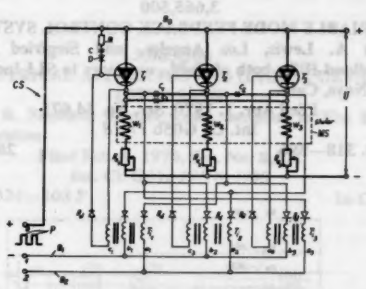
Arpad Kelemen, and Mircea Crivii, both of Cluj, Romania, assignors to Institutul Politehnic Cluj, Cluj, Romania

Filed Mar. 5, 1970, Ser. No. 16,746

Claims priority, application Romania, Mar. 7, 1969, 59296

Int. Cl. H02p *5/40*

U.S. Cl. 318—227 **6 Claims**



The three phase windings of the stator of an induction motor are in series with respective thyristors connected across a source of direct current, the thyristors being capacitively interconnected in a lockout circuit whereby only one at a time can conduct. Connected in parallel with each phase winding is a circuit including the output of a generator of unipolar switching pulses and the primary of a transformer whose secondary lies in the input of the thyristor next in line whereby the latter is rendered conductive in response to a switching pulse traversing the previously conductive thyristor. By switching the pulse generator to a set of al-

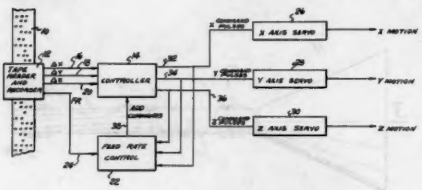
ternate transformer primaries connected to the thyristor outputs in a different order, the sense of motor rotation can be reversed.

3,665,499

FEEDRATE SEVVO CONTROL SYSTEM

Hymie Cutler, Detroit, Mich., assignor to The Bendix Corporation

Filed Mar. 30, 1970, Ser. No. 23,773
Int. Cl. G05b *19/24*
U.S. Cl. 318—571 **5 Claims**



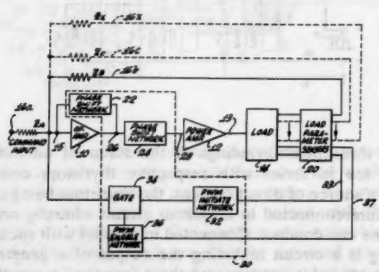
A numerical control system for a milling machine utilizes program tapes which include feedrate commands expressing the desired resultant rate of motion of the machine output member directly in inches per minute. The control system accepts this number and generates a pulse train having a rate proportional to the number by repeatedly adding the number into a register and generating the pulse train from the overflows from that register. This pulse train is provided to a circuit which generates a series of numerical values each equal to the square of the number of pulses received from the train at the time. The pulse commands to each of the individual axis servos are also provided to similar squaring circuits and the numerical values generated by the squaring circuits for these command pulse trains are summed and subtracted from numbers generated from the feedrate control pulse train. Control signals to the controller which generates the command pulse trains are provided so as to maintain an equality between the integrals of the two series of numbers, thereby commanding individual axis motions which will achieve a resultant motion in agreement with the feedrate command.

3,665,500

VARIABLE MODE FEEDBACK CONTROL SYSTEM

Martyn A. Lewis, Los Angeles, and Siegfried Domin, Woodland Hills, both of Calif., assignors to SLI Industries, Van Nuys, Calif.

Filed Apr. 1, 1970, Ser. No. 24,671
Int. Cl. G05b *11/18*
U.S. Cl. 318—596 **26 Claims**



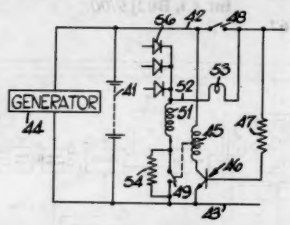
Apparatus selectively and automatically operable in either a linear or a pulse-width modulation mode. A controlled feedback loop in a basically linear system is automatically closed in response to threshold conditions of particular parameters of a moving inductance type load, the loop providing positive feedback in a range of frequencies determined by the phase shift characteristics of the load and additional phase shift circuits. The positive feedback results in a controlled oscillatory condition producing a pulse-width modulation mode for the system.

3,665,501

BATTERY CHARGING SYSTEMS FOR USE IN ROAD VEHICLES

Maurice James Wright, Harborne, Birmingham, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Continuation of application Ser. No. 630,041, Apr. 11, 1967, now abandoned. This application Feb. 8, 1971, Ser. No. 13,731
Int. Cl. H02j *7/14*
U.S. Cl. 320—039 **5 Claims**



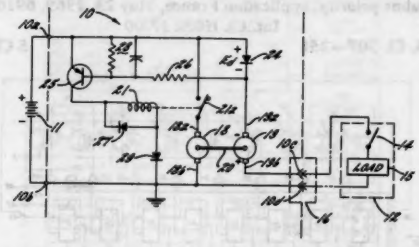
A battery charging system includes a generator for charging the battery, and a voltage regulator for controlling the output of the generator, the voltage regulator including a voltage sensing stage which senses the output voltage of the battery, and a control stage operable by said voltage sensitive stage for varying the current flow to the field winding of the generator to regulate the output voltage thereof, said control stage being connected to the battery through a series circuit including a resistor and the ignition switch of the vehicle, said voltage sensing stage being connected directly across the battery (i.e. not through the ignition switch) at least when the ignition switch is closed, and means being provided for effectively short-circuiting the series connection of said resistor and ignition switch when the generator produces an output.

3,665,502

ENERGY CONSERVING VOLTAGE CONVERTER

William A. Means, Rockford, Ill., assignor to Applied Motors, Inc., Rockford, Ill.

Filed May 27, 1971, Ser. No. 147,371
Int. Cl. H02m *7/64*
U.S. Cl. 321—28 **11 Claims**



An electrical motor-generator converter drawing energy from a low voltage (e.g., 12 volts) battery to operate portable electric tools or the like rated for commercially standard utility voltages (e.g., 120 volts), characterized by the feature that when the portable tool switch is turned on or off the motor-generator is started or stopped, thereby avoiding dis-

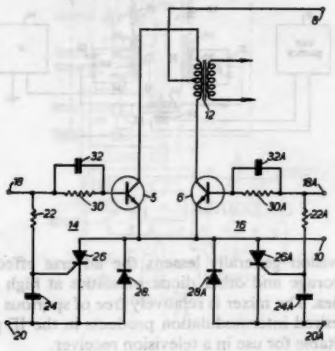
sipation of energy during those times when the power tool is not actually being used.

3,665,503

ELECTRICAL INVERTER CIRCUIT ARRANGEMENTS

Roger W. Wheaton, North Baddesley, England, assignor to Plessey Handel und Investments A.G., Zug, Switzerland

Filed Jan. 11, 1971, Ser. No. 105,517
Claims priority, application Great Britain, Jan. 9, 1970, 1,107/70
Int. Cl. H02m *7/48*
U.S. Cl. 321—45 R **7 Claims**



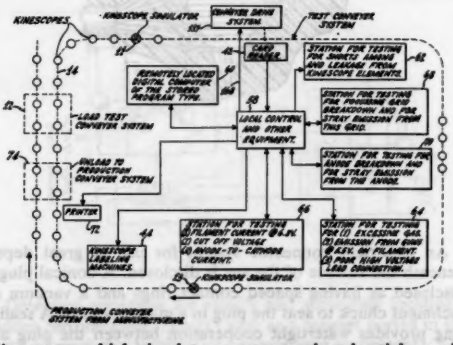
A transistor inverter circuit comprises two transistors which are switched on alternately via respective control circuits. Each control circuit provides a direct path for a TURN OFF pulse but incorporates in the turn on path a silicon controlled rectifier associated with a time delay circuit which delays the switching on of the silicon controlled rectifier after occurrence of the TURN ON pulse. Thus, each transistor receives a TURN OFF pulse immediately but the other transistor does not receive the TURN ON pulse until a time delay has lapsed. The time delay is sufficient to ensure that each transistor is fully switched off before the other is turned on.

3,665,504

CHECKING AN AUTOMATIC TESTING SYSTEM

Herbert William Silverman, Sudbury, Mass., assignor to RCA Corporation

Original application Aug. 22, 1967, Ser. No. 662,360, now Patent No. 3,541,440, dated Nov. 17, 1970. Divided and this application Mar. 12, 1970, Ser. No. 18,917
Int. Cl. G01r *31/22, 15/12*
U.S. Cl. 324—26 **3 Claims**



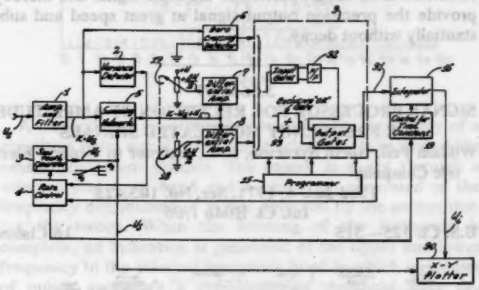
Apparatus which simulates a mass produced article, such as a color kinescope, and which is employed for the purpose of ascertaining not whether a manufactured article is within manufacturing specifications but instead whether a system which is automatically testing the mass produced articles is itself operating properly.

3,665,505

APPARATUS AND METHOD FOR MEASURING AND ANALYZING DYNAMIC PROCESSES

Hartmut Euer, and Guenter Pauli, both of Munich, Germany, assignors to Vereinigte Flugtechnische Werke Fokker GmbH, Bremen, Germany

Filed Apr. 22, 1970, Ser. No. 30,885
Claims priority, application Germany, Apr. 24, 1969, P 19 20 964.4
Int. Cl. G01r *23/16, 27/02*
U.S. Cl. 324—77 A **16 Claims**



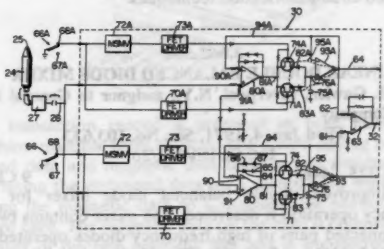
Apparatus and method for analyzing dynamic processes represented by a particular time variable information signal within a range for amplitudes of the signal, wherein a signal analyzing amplitude band is defined and particular characteristic portions of the signal when occurring within the band are detected. By means of sweep signal the analyzing band is shifted across the amplitude range and the detected events are accumulated as statistical representation evaluation of the occurrence of the characteristic portions in dependence upon amplitude as represented by the sweep signal as defining the position of the analyzing band within the amplitude range.

3,665,506

ELECTRICAL APPARATUS AND GAGING DEVICE USING SAME

Norman R. Sanford, Dayton, Ohio, assignor to The Bendix Corporation

Filed Feb. 4, 1970, Ser. No. 8,571
Int. Cl. G01r *19/16, 1/00*
U.S. Cl. 324—103 P **16 Claims**



An electrical apparatus and gaging device using same wherein an electrical input signal is improved in quality and

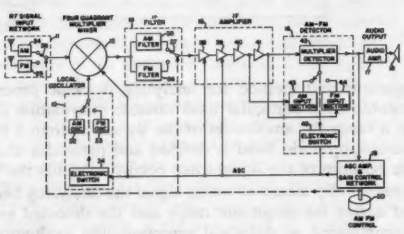
useability to provide a precision electrical output signal through the cooperating arrangement of an amplifier, a capacitor, and a pair of charging devices, wherein the first device of the pair is operatively connected between the output terminal of the amplifier and the output connection of the capacitor and allows only negative charging of the capacitor and the second device of such pair is operatively connected between such output terminal and output connection and allows only positive charging of the capacitor. One of the devices is energized for a predetermined short time interval and the other of the devices is energized for a substantially unlimited time interval with the devices cooperating with the amplifier during the predetermined time interval causing the voltage level at the output connection to be equal in magnitude to the voltage level of the input signal to define an initial voltage condition. The other charging device then cooperates with the amplifier to change the voltage level at the output connection only in one direction from its initial condition in direct proportion to the input signal and thereby provide the precision output signal at great speed and substantially without decay.

3,665,507

SIGNAL PROCESSOR FOR RECEPTION OF AMPLITUDE OR FREQUENCY MODULATED SIGNALS

William Peil, North Syracuse, N.Y., assignor to General Electric Company

Filed Jan. 4, 1971, Ser. No. 103,425
Int. Cl. H04b *1/06*
U.S. Cl. 325—315 **16 Claims**



A signal processor for the reception of amplitude or frequency modulated signals and the principal signal processing component of an AM-FM radio receiver is described. The processor principally comprises a multiplier-mixer, a wideband amplifier, and a multiplier detector which are operable in both AM and FM modes. The processor is switched from one mode to another by a manual control which converts the IF amplifier from AGC controlled linear amplification for AM to high gain limiting amplification for FM and selectively activates AM and FM signal inputs to the detector and appropriate AM and FM high frequency oscillators for the mixer. The processor is particularly adapted for integrated circuit fabrication techniques.

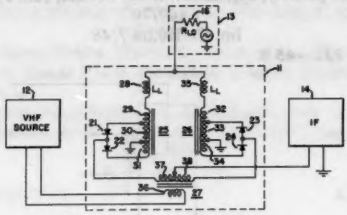
3,665,508

LINEAR DOUBLE BALANCED DIODE MIXER

Glenn B. Gawler, Liverpool, N.Y., assignor to General Electric Company

Filed Jan. 4, 1971, Ser. No. 103,633
Int. Cl. H04b *1/26*
U.S. Cl. 325—446 **9 Claims**

An improved double balanced diode mixer for high frequency operation is described. The mixer contains two series connected pairs of high frequency diodes operated in a modified bridge configuration. The diode series pairs are alternately switched on and off by a local source of high frequency oscillations. The high frequency signal being mixed is applied across the interconnections between the diodes in each series pair. An IF output signal resulting from the mixing process is derived at the output. Mutual isolation is provided between the diode series pairs in their coupling to the local source so that current flowing in one pair produces a minimum effect upon current flowing in the other pair.



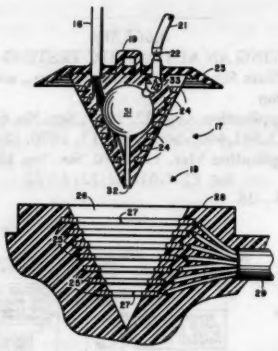
This provision generally lessens the adverse effects of the charge storage and other diode parasitics at high operating frequencies. The mixer is relatively free of spurious responses and undesired intermodulation products in the IF pass band and is suitable for use in a television receiver.

3,665,509

UNDERWATER ELECTRICAL CONNECTOR

James H. Elkins, Lynn Haven, Fla., assignor to The United States of America as represented by the Secretary of the Navy

Filed Mar. 22, 1971, Ser. No. 126,762
Int. Cl. H01r *13/54*
U.S. Cl. 339—12 V **10 Claims**

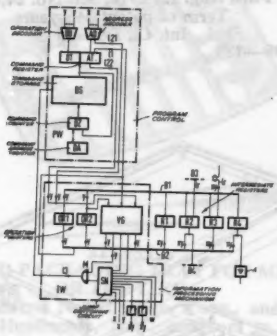


An electrical connector system for use at great depths beneath the surface of the sea is disclosed. A conical plug is disclosed as having spaced contact rings and a vacuum attachment chuck to seat the plug in a mating socket. A sealing ring provides watertight cooperation between the plug and socket in such a manner as to retain the plug in place by hydrostatic pressure.

3,665,510
PROGRAM CONTROLLED DATA PROCESSING INSTALLATION FOR SWITCHING A TELEPHONE EXCHANGE

Fritz Brandt, and Wolfram Ernst, Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Mar. 20, 1970, Ser. No. 21,315
Claims priority, application Germany, Mar. 21, 1969, P 19 14 575.6
Int. Cl. H04m *3/00*; **G06f** *9/00*
U.S. Cl. 340—172.5 **7 Claims**

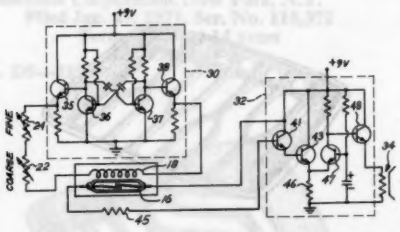


A program controlled data processing installation which is particularly useful with telecommunication exchange switching is described. The system includes an information processing mechanism controlled by a program control mechanism. The data processing installation is of the type which is capable of executing branching operations upon receipt of a jump command. The installation includes a jump switching network which forms and delivers the jump commands to the program control mechanism. In the jump switching network, internal unconditional jump information and conditional jump information is processed in the course of the execution of a program along with external jump information. The jump switching network includes a plurality of coupling members which are individually associated with the particular jump commands to be executed.

3,665,511
MAGNETIC DETECTION APPARATUS

John E. Wolf, Marengo, Ill., assignor to Superior Continental Corporation, Hickory, N.C.

Filed Mar. 2, 1970, Ser. No. 15,556
Int. Cl. G08b *13/00*
U.S. Cl. 340—258 D **3 Claims**

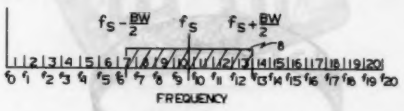


Detection apparatus for rapidly and accurately locating a hidden ferromagnetic object (such as a magnet buried in the earth to mark the location of underground equipment). The overlapping reeds in an evacuated reed switch capsule are set into motion by a fluctuating magnetic field. The strength of this fluctuating field is adjusted such that the two reeds nearly come into contact as they are deflected toward one another by the applied field. The presence of the additional, steady field created by a nearby ferrous object causes the reeds to actually make contact, thereby energizing a signalling device to indicate the location of the object.

3,665,512
METHOD AND APPARATUS FOR DETECTING THE FREQUENCY OF A REPETITIVE PULSE SIGNAL

Stanley Rylon Hall, Ellicott City, and Thomas Gilbert Nichols, Silver Spring, both of Md., assignors to The Bunker-Ramo Corporation, Oak Brook, Ill.

Filed June 1, 1970, Ser. No. 42,355
Int. Cl. G01r *23/02*
U.S. Cl. 343—18 E **29 Claims**

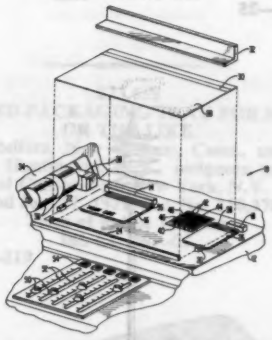


A method and apparatus for detecting the frequency of a repetitive pulse signal with greater selectivity than that of the sensor equipment utilized. The sensor is swept through a selected frequency band and a histogram generated of the frequency distribution of pulses detected by the sensor during the sweep. When the forming of the histogram is complete, an indication is generated of the upper and lower frequency in the selected frequency band in which a number of pulses exceeding a predetermined threshold were detected. The upper and lower frequency indications are then utilized to determine the desired frequency.

3,665,513
PASSIVE MAGNETIC TRANSFER OF DISCRETE MAGNETIC INFORMATION

Allen B. Benson, Rochester, Minn., and Elbert Troy Hatley, San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 29, 1969, Ser. No. 888,639
Int. Cl. G01d *15/12*; **G06k** *19/08*
U.S. Cl. 346—74 M **8 Claims**



A transaction record is prepared in both human and machine readable form by providing a card having both embossed data and magnetic data thereon and simultaneously imprinting the embossed data on a record card while transferring the magnetic data to a magnetizable portion of the record card. The magnetic data on the card is comprised of a plurality of discrete magnetic bits and is transferred to the magnetizable portion of the record card by subjecting the magnetic data and the magnetizable portion to a saturating prebiased D.C. field followed by a weaker D.C. transfer field.

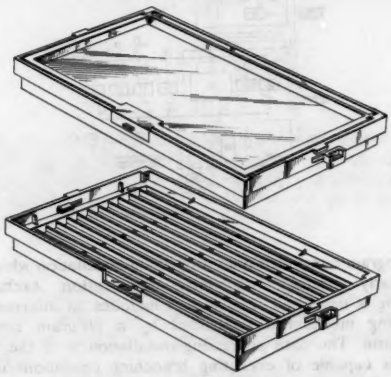
DESIGNS

MAY 23, 1972

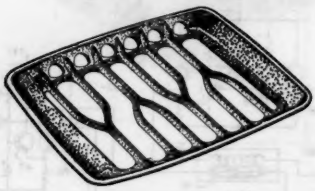
223,650
SASH
Melvin V. Zakarin, 23 Ogden Lane, Englishtown, N.J. 07726
Filed July 20, 1970, Ser. No. 24,016
Term of patent 3½ years
Int. Cl. D2—*07*
U.S. Cl. D2—385

223,651
TOOTHBRUSH
Lawrence Hermann, 180 West End Ave., New York, N.Y. 10025
Filed July 24, 1970, Ser. No. 24,111
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—25

223,652
CASE FOR ART SUPPLIES
Martin A. Jaffe, 3001 Henry Hudson Parkway, Bronx, N.Y. 10463; George S. Northrop, 3200 Hickory St., Wantagh, N.Y. 11793; and Samuel Braun, 75 Greenhaven Road, Rye, N.Y. 10580
Filed Aug. 12, 1970, Ser. No. 24,445
Term of patent 3½ years
Int. Cl. D9—*03*
U.S. Cl. D9—189

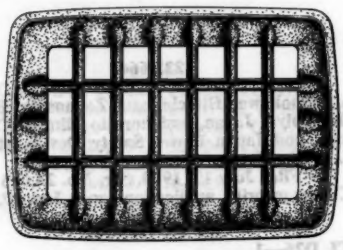


223,653
MOLDED PACKAGING TRAY FOR MEAT OR THE LIKE
Richard F. Reifers, New Canaan, Conn., and Kenneth D. Bixler, Huntington, N.Y., assignors to Diamond International Corporation, New York, N.Y.
Filed Jan. 27, 1971, Ser. No. 110,353
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—219



223,654
MOLDED PACKAGING TRAY FOR MEAT OR THE LIKE
Richard F. Reifers, New Canaan, Conn., and Kenneth D. Bixler, Huntington, N.Y., assignors to Diamond International Corporation, New York, N.Y.
Filed Jan. 27, 1971, Ser. No. 110,366
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—219

223,655
MOLDED PACKAGING TRAY FOR MEAT OR THE LIKE
Richard F. Reifers, New Canaan, Conn., and Kenneth D. Bixler, Huntington, N.Y., assignors to Diamond International Corporation, New York, N.Y.
Filed Jan. 27, 1971, Ser. No. 110,367
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—219



223,656
MOLDED PACKAGING TRAY FOR MEAT OR THE LIKE
Richard F. Reifers, New Canaan, Conn., and Kenneth D. Bixler, Huntington, N.Y., assignors to Diamond International Corporation, New York, N.Y.
Filed Jan. 27, 1971, Ser. No. 110,372
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—219

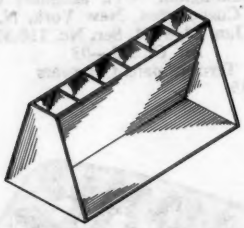
223,657
MOLDED PACKAGING TRAY FOR MEAT OR THE LIKE
Richard F. Reifers, New Canaan, Conn., and Kenneth D. Bixler, Huntington, N.Y., assignors to Diamond International Corporation, New York, N.Y.
Filed Jan. 27, 1971, Ser. No. 110,373
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—219

223,658
MOLDED PACKAGING TRAY FOR MEAT OR THE LIKE
Richard F. Reifers, New Canaan, Conn., and Kenneth D. Bixler, Huntington, N.Y., assignors to Diamond International Corporation, New York, N.Y.
Filed Jan. 27, 1971, Ser. No. 110,374
Int. Cl. D9—*03*
Term of patent 14 years
U.S. Cl. D9—219

223,659
MOLDED PACKAGING TRAY FOR MEAT OR THE LIKE
Richard F. Reifers, New Canaan, Conn., and Kenneth D. Bixler, Huntington, N.Y., assignors to Diamond International Corporation, New York, N.Y.
Filed Jan. 27, 1971, Ser. No. 110,378
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—219

223,660
BUILDING STRUCTURE
Glen C. Hancock, Sarasota, Fla., and Wilmer Terry Young, Charlotte, N.C., assignors to Shoney's South, Inc., Memphis, Tenn.
Filed Oct. 6, 1970, Ser. No. 25,358
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1

223,661
PIPETTE STORAGE RACK
David E. Berg, 3326 S. 78th St., Omaha, Nebr. 68124
Filed Oct. 15, 1970, Ser. No. 25,499
Term of patent 14 years
Int. Cl. D24—*02*; D6—*99*
U.S. Cl. D16—1



223,662
FISHING LINE GUIDE
Thomas E. Coalson, 15182 Warwick Circle, Westminster, Calif. 92683
Filed May 28, 1970, Ser. No. 23,183
Term of patent 14 years
Int. Cl. D22—*08*
U.S. Cl. D22—24

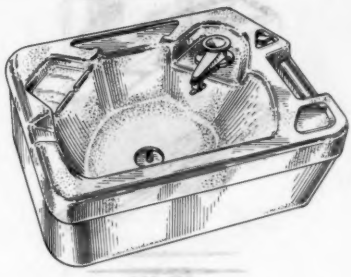
223,663
NIGHTSTICK
Frank E. Bortzfield, L–14 Lake Lotawana, Lee's Summit, Mo. 64063
Filed Dec. 8, 1969, Ser. No. 20,406
Term of patent 14 years
Int. Cl. D22—*02*
U.S. Cl. D22—99

223,664
EARTH BAR
Kiyoo Tsunokawa, Hitachi, and Zennosuke Fukushima, Nishinomiya, Japan, assignors to Hitachi Cable, Ltd., Tokyo, and Japan Power Safety Device M.F.G. Co., Ltd., Osaka, Japan
Filed July 17, 1970, Ser. No. 24,013
Claims priority, application Japan Jan. 27, 1970
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—1

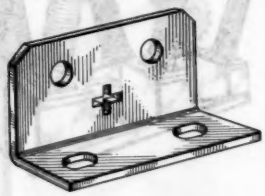
223,665
COATING FLAW DETECTOR
Charles W. Eisele, Warminster, Pa., assignor to H. C. Price Co., Bartlesville, Okla.
Filed Feb. 25, 1971, Ser. No. 119,066
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D26—1

223,666
COATING HOLIDAY DETECTOR
Charles W. Eisele, Warminster, Pa., assignor to H. C. Price Co., Bartlesville, Okla.
Filed Feb. 25, 1971, Ser. No. 119,068
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D26—1

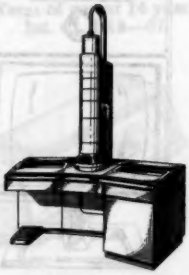
223,667
PORTABLE SINK UNIT
Michael J. DiPierro, Michael A. DiPierro, and Donald P. Mastrovito, Shrewsbury, Mass., assignors to Standard Oil Company, Chicago, Ill.
Filed Oct. 8, 1970, Ser. No. 25,378
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—58



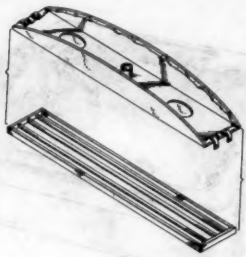
223,668
BATTERY CABLE CONNECTION POST
Theodore Ulrich, Copiague, N.Y., assignor to Svenska Ackumulator Aktiebolaget Jungner, Oskarshamn, Sweden
Filed Sept. 14, 1970, Ser. No. 24,959
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—1



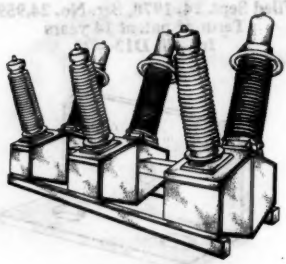
223,669
ELECTRON MICROSCOPE
Seiichi Nishino, Kazuyoshi Kato, and Hiroshi Akahori, Katsuta-shi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Feb. 13, 1970, Ser. No. 21,427
Term of patent 14 years
Int. Cl. D16—*08*
U.S. Cl. D26—5



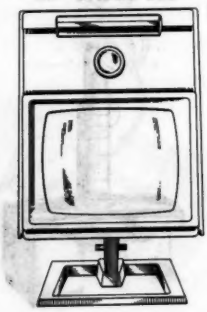
223,670
CAR SPEAKER CABINET
Glenn R. Kloster, 212 N. 30th Ave., Yakima, Wash. 98902
Filed Feb. 18, 1970, Ser. No. 21,486
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14



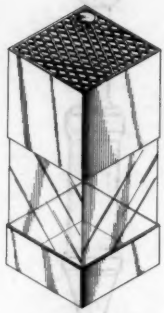
223,671
CIRCUIT BREAKER
William A. Forsty, Murrysville, Ronald W. Crookston, Trafford, and August U. Bertolino, Jeannette, Pa., assignors to Westinghouse Electric Corporation
Filed Sept. 10, 1970, Ser. No. 24,921
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—13



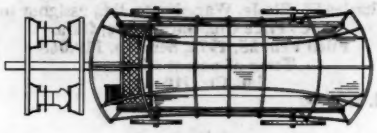
223,672
PICTURE TELEPHONE
Hans Sjöholm, Stockholm, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden
Filed Nov. 3, 1970, Ser. No. 25,796
Claims priority, application Sweden May 4, 1970
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14



223,673
AQUARIUM OR SIMILAR ARTICLE
Alberto W. Collie, Cedar Hill, Tex., assignor to Oceanology Systems Design, Richardson, Tex., composed of Alberto W. Collie, Vernon Porter, and David Blacknall, partners
Filed Nov. 10, 1970, Ser. No. 25,914
Term of patent 7 years
Int. Cl. D30—*02*
U.S. Cl. D30—6

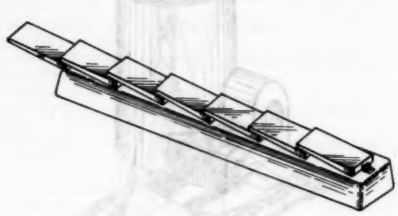


223,674
COVERED WAGON PLAYGROUND CLIMBER OR THE LIKE
Roland W. Johnson, Hastings, Nebr., assignor to American Play-World, Inc., Hastings, Nebr.
Filed July 27, 1970, Ser. No. 24,152
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D34—5

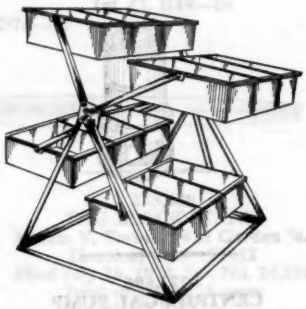


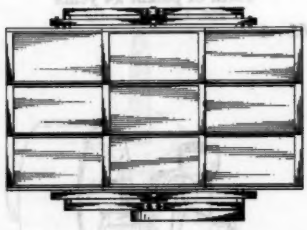
223,675
RIDABLE BOUNCING TOY
Peter Ian Raphael, 4 Betteymere Road, Cheadle Hulme, England
Filed Apr. 27, 1970, Ser. No. 22,672
Claims priority, application Great Britain Jan. 7, 1970
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15

223,676
DOMINO-ACTION TOY OR SIMILAR ARTICLE
Harry Meth and Allen Greenberg, Cincinnati, Ohio, assignors to General Mills Fun Group, Inc., Minneapolis, Minn.
Continuation of abandoned design applications Ser. No. 15,586 and Ser. No. 15,587, both Jan. 31, 1969. This application Oct. 12, 1970, Ser. No. 25,449
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15



223,677
ROTATABLE PLANTER
Lloyd C. Wienert, 3606 S. 91st, Omaha, Nebr. 68124
Filed Sept. 4, 1970, Ser. No. 24,839
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D35—3

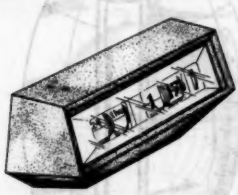




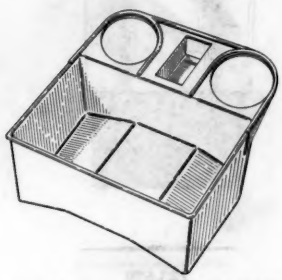
223,678
TUMBLER
James S. Adler, Chicago, and John T. Dolby, Evanston, Ill., assignors to Standard Oil Company, Chicago, Ill.
Filed July 31, 1969, Ser. No. 18,482
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D36—8

223,679
COTTON PICKING SPINDLE
Norman G. Hayward, Rte. 2, P.O. Box 1196, Manassas, Va. 22110
Filed Aug. 12, 1970, Ser. No. 24,436
Term of patent 14 years
Int. Cl. D8—*01*; D15—*03*
U.S. Cl. D40—1

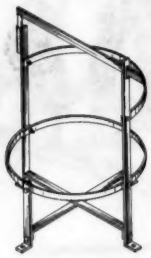
223,680
CALENDAR CLOCK OR SIMILAR ARTICLE
Riki Watanabe, Tokyo-to, Japan, assignor to Kabushiki Kaisha Koparu, Tokyo-to, Japan
Filed Oct. 16, 1970, Ser. No. 25,535
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D42—7



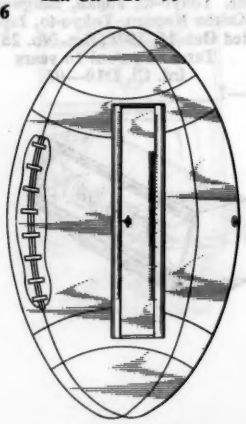
223,681
COMBINED REFUSE RECEPTACLE AND ARTICLE CARRIER FOR AUTOMOBILES OR THE LIKE
Wiley M. Whitaker, 227 Lexington Road, Asheboro, N.C. 27203
Filed Dec. 28, 1970, Ser. No. 26,658
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D49—32



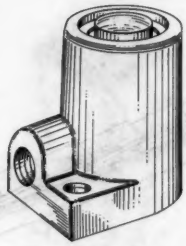
223,682
GARBAGE CAN HOLDER
John Aldape, 1300 Santa Paula, Boise, Idaho 83702
Filed Mar. 8, 1971, Ser. No. 122,293
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D49—30



223,683
SLIDE RULE
Addison W. Learned III and Rosalie C. Learned, both of 88 Dorset Road, Holliston, Mass. 01746
Filed Aug. 5, 1970, Ser. No. 24,314
Term of patent 7 years
Int. Cl. D10—*99*
U.S. Cl. D52—6

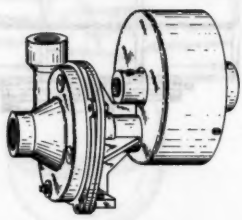


223,684
CAST BODY RAM
Alexander W. McPherson, 30012 Briarton, Farmington, Mich. 48024
Filed Aug. 11, 1970, Ser. No. 24,417
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D55—1

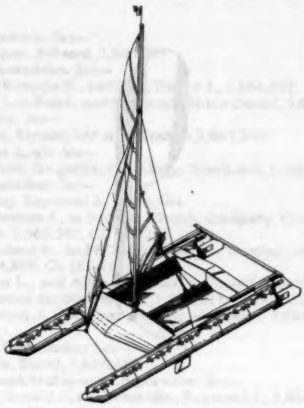


223,685
CYLINDRICAL BODY RAM
Alexander W. McPherson, 30012 Briarton, Farmington, Mich. 48024
Filed Aug. 11, 1970, Ser. No. 24,425
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D55—1

223,686
CENTRIFUGAL PUMP
Harry J. Sadler, St. Paul, and Ramon Pareja, Minneapolis, Minn., assignors to Hypro, Inc., St. Paul, Minn.
Filed Jan. 9, 1970, Ser. No. 20,859
Term of patent 14 years
Int. Cl. D15—*02*
U.S. Cl. D65—1

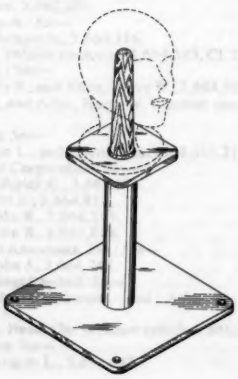


223,687
SAILBOAT
Gary Philip Wiederhold, 3952 Garfield Ave. S., Minneapolis, Minn. 55408
Filed Sept. 10, 1970, Ser. No. 24,943
Term of patent 3½ years
Int. Cl. D12—*06*
U.S. Cl. D71—1

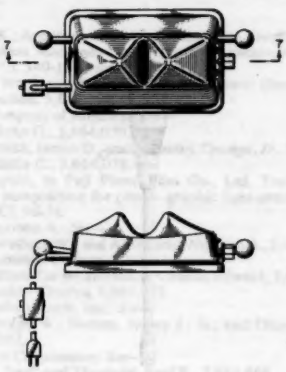


223,688
PEN CASING
Martin Schnur, Fort Lee, and Mel Appel, Livingston, N.J., assignors to Magic Marker Corporation, Glendale, N.Y.
Filed July 6, 1970, Ser. No. 23,829
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D74—17

223,689
WIG BLOCK STAND
Martin V. Forbes, 7614 Garden St., Houston, Tex. 77012
Filed July 28, 1970, Ser. No. 24,196
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D80—8

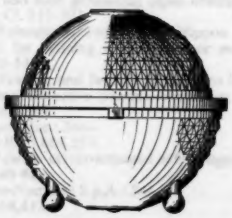


223,690
SPINAL CORD TREATING APPARATUS
Susumu Koizumi, 27–8 Kidacho, Neyagawa, Osaka, Japan
Filed June 8, 1970, Ser. No. 23,343
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D83—1



223,691
MAKEUP HEATER
Elizabeth Newman, Hollywood, Calif., assignor to The Petal Corporation
Filed Aug. 8, 1969, Ser. No. 18,602
Term of patent 14 years
Int. Cl. D3—*99*
U.S. Cl. D86—10

223,692
JEWELRY CASE OR SIMILAR ARTICLE
Martin A. Jaffe, 3001 Henry Hudson Parkway, Bronx, N.Y. 10463; George S. Northrop, 3200 Hickory St., Wantagh, N.Y. 11793; and Samuel Braun, 75 Greenhaven Road, Rye, N.Y. 10580
Filed Aug. 12, 1970, Ser. No. 24,443
Term of patent 3½ years
Int. Cl. D3—*99*
U.S. Cl. D87—1



223,693
LIQUID DISPENSER
Yiu Dak Chi, Lowloon, Hong Kong, assignor to Forda Manufacturing Company Limited, Kowloon, Hong Kong
Filed Jan. 27, 1970, Ser. No. 21,100
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D94—3

223,694
BOOKMARK
Walter J. McKenna, 80—01 247th St., Bellerose, N.Y. 11426
Filed June 3, 1970, Ser. No. 23,271
Term of patent 14 years
Int. Cl. D19—*99*
U.S. Cl. D97—2

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 23D DAY OF MAY, 1972

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

AAI Corporation: *See—*
Velazquez, Edward, 3,665,277.

Abbott Laboratories: *See—*
Knox, Kenneth H.; and Ries, Robert J., 3,664,338.
Swett, Leo Ralph; and Ratajczyk, James Daniel, 3,665,008.

Abe, Toshiro: *See—*
Kojima, Kiyoshi; and Abe, Toshiro,3,665,340.

Abegg, Jean-Louis: *See—*
Kalopissis, Gregorire; and Abegg, Jean-Louis,3,665,072.

Abex Corporation: *See—*
Novotny, Raymond J., 3,664,584.

Acello, Salvatore J., to Sprague Electric Company. Ceramic capacitor terminals. 3,665,267, Cl. 317-258.

Ackley, Richard H., to PPG Industries, Inc. Needled resin fibrous article. 3,664,909, Cl. 161-141.

Adams, Don L.; and Allen, Nicholas, to United Aircraft Corporation. Flight control disabling system. 3,665,217, Cl. 307-235.

Adams, Robert J. Container washing apparatus. 3,664,355, Cl. 134-143.

Addmaster Corporation: *See—*
Weinkle, David, 3,664,259.

Addressograph Multigraph Corporation: *See—*
Miller, Donald J.; and Schmidlin, Raymond J., 3,664,260.

Advance Transformer Co.: *See—*
Freegard, Ernest M., 3,664,624.

Aerojet-General Corporation: *See—*
Roberts, Ernest Roth, 3,664,928.

Aerospace Research, Inc.: *See—*
Galvin, Aaron A., 3,665,443.

Agency of Industrial Science and Technology,: *See—*
Kawai, Hidetoshi; Iizuka, Hajime; Shinkai, Takuo; and Yoshioka, Yoshiro, 3,665,398.

Air Land Systems Co.: *See—*
Fleming, James Evans; Lovell, Clarence A.; and Bandle, James M., 3,665,468.

Air Products and Chemicals, Inc.: *See—*
Cornelius, Edward B.; and Koester, David W., 3,665,049.
Moyer, Ronald C.; and Uffner, Melville W., 3,664,987.

Ajinomoto Co., Inc.: *See—*
Kakuta, Hiroshi, 3,664,854.

Akamatsu, Masahiko: *See—*
Dhno, Eiichi; and Akamatsu, Masahiko,3,665,286.

Akhmedov, Rustam Berovich; Talibdzhanov, Zakhidzhan Sadykdzhanovich; Valikhodzhaev, Asomkhodzha; and Rashidov, Faizulla Karimovich. Burner device for combustion gases. 3,664,587, Cl. 239-402.5

Akiyama, Katsuhiko. Air-isolated integrated circuit devices to facilitate the connection thereof to circuit boards. 3,665,263, Cl. 317-235.00r

Aktiebolaget Hassle: *See—*
Brandstrom, Arne Elof; and Carlsson, Stig Ake Ingemar, 3,665,074.

Aktiebolaget Siefvert & Fornander: *See—*
Struve, Hans Peter, 3,664,817.

Aktiengesellschaft Brown, Boveri & Cie: *See—*
Spiess, Gustav, 3,665,272.

Akzo, N.V.: *See—*
Bussink, Jan, 3,665,051.

Alfa Romeo S.p.A.: *See—*
Garcea, Giampaolo, 3,664,316.

Allen, Dillis V. Vehicle trackway. 3,664,583, Cl. 238-5.

Allen, Harry W.: *See—*
Allen, Mary E.; and Allen, Harry W.,3,664,320.

Allen, Mary E.; and Allen, Harry W. Contour vise. 3,664,320, Cl. 125-35.000

Allen, Nicholas: *See—*
Adams, Don L.; and Allen, Nicholas,3,665,217.

Allied Chemical Corporation: *See—*
Booth, Frederick C., 3,665,385.
Hoyt, Ernest B., 3,664,812.
Kramer, John B., 3,664,315.
Kramer, John B., 3,664,818.

Allied Research Associates, Inc.: *See—*
Driscoll, John J., 3,664,263.

Allspeeds Holdings Limited: *See—*
Blake, John Berchmans; and Ashworth, Roger Anderton, 3,664,474.

Alms, Erhard E. Heater for pressure switch. 3,665,359, Cl. 337-2.

ALN Enterprises: *See—*
La Neve, Angelo L., 3,664,643.

Alstad, John K.; Armitage, John D., Jr.; and Bate, Geoffrey, to International Business Machines Corporation. Magneto-optic transducer. 3,665,431, Cl. 340-174.1mo

Alter, Henry Ward; and Price, Paul B., to General Electric Company. Radon detection. 3,665,194, Cl. 250-83.

Aluminum Company of America: *See—*
Bowser, John O., 3,664,079.
Klingensmith, James D.; and Volinsky, George, Jr., 3,664,080.
Merkin, Billie C., 3,664,078.

Amano, Hiroyuki, to Fuji Photo Film Co., Ltd. Treatment of and developing composition for photo- graphic light-sensitive materials. 3,664,838, Cl. 96-56.

Amendola, Norman A.: *See—*
Choate, Wallace W.; and Amendola, Norman A.,3,664,087.

American Cyanamid Company: *See—*
Gray, William David; and Rauh, Charles Edward, 3,665,075.
Maske, Bobby Charles, 3,664,952.

American Kitchen Foods, Inc.: *See—*
Raye, George W.; Dumas, Henry J., Jr.; and Duncan, Lloyd N., 3,664,397.

American Lava Corporation: *See—*
Davis, M. Paul; and Theobald, Paul R., 3,664,868.

American Optical Corporation: *See—*
Bole, Hamilton B., 3,663,983.
Gibney, Lloyd W., 3,664,789.
Robinson, Charles C.; and Snitzer, Elias, 3,664,725.

American Pollution Controlled, Inc.: *See—*
Seeley, Harvey E., Jr., 3,664,648.

American Standard Inc.: *See—*
Barkovitz, William E.; and Przygocki, Julius V., 3,664,094.
Brunner, Richard; and Mahon, Roger F., 3,664,190.
Groteke, Daniel Edward, 3,664,410.
Vincent, James Henry, 3,664,092.
Wallick, Claude Rollin, Jr.; Blodgett, William Edward; and Lazor, Donald Keith, 3,664,799.

AMF Incorporated: *See—*
Langenhop, John Herman, 3,664,485.

Amidon, Alan B.; Sankus, Joseph G.; Petruzzella, Nicholas L.; and Ewing, Joan R., to Xerox Corporation. Migration imaging method employing adhesive transfer member. 3,664,834, Cl. 96-1.4

Ammons, Robert L.; and Moore, Robert B., Jr., to Eastman Kodak Company. Spun polyester strands and method for making. 3,664,114, Cl. 57-140.00r

Amos, Ralph A.: *See—*
Carter, Robert; Amos, Ralph A.; and Gregory, Charles A., Jr.,3,665,495.

AMP Incorporated: *See—*
Hammell, Kemper Martel; and Kaylor, Karl Lester, 3,665,378.
Hartmann, Karl lilhelm, 3,665,370.
Lau, Ralph Rupp; and Sitz, Gilbert Carl, 3,664,218.
Lockard, Joseph Larue; and Rose, William Henry, 3,665,127.

Ampex Corporation: *See—*
Emmons, Lawrence D., 3,665,099.

Amscat Corporation: *See—*
Thayer, Olin E., 3,665,474.

Amthor, Helmut K., to Union Carbide Corporation. Pressure relief vent valve for a fluid tight sealed container especially an alkaline galvanic cell. 3,664,878, Cl. 136-178.

Anati, Reuven. Wrench. 3,664,213, Cl. 81-91.

Anderson, Donald R.: *See—*
Oberhofer, Alfred W.; Anderson, Donald R.; and Payne, Charles C.,3,664,870.

Anderson, Greenwood & Co.: *See—*
Weise, Irvin B., 3,664,362.

Anderson, Robert Du Wayne, to TCI, Inc. Two pin adjustable hitch. 3,664,686, Cl. 280-490.

Ando, Masao, to Chisso Corporation. Method for constructing transportation pipes and heat generating pipes utilizing skin-effect current. 3,665,154, Cl. 219-301.

Ando, Ryo; and Fukushima, Tsutomu, to Nippon Kokan Kabushiki Kaisha. Method for refining molten iron or molten iron alloys. 3,664,827, Cl. 75-51.

Andrew, Herbert Francis; and Jackson, Neville, to Imperial Chemical Industries Limited. Reactive triazine containing disazo dyestuffs. 3,664,995, Cl. 260-146.

Anetsberger Brothers, Inc.: *See—*
Meyer, Alfred E., 3,664,257.

Annas, John T. Vehicle driver-actuated safety signal light assembly. 3,665,392, Cl. 340-67.

Ansaldo Meccanico-Nucleare S.p.A.: *See—*
Bo, Carlo, 3,664,413.

Anthony, Peter C.; Colt, James G.; and Fournarakis, Solon, to Carpetech Corporation. Portable vacuum carpet and upholstery cleaning apparatus. 3,663,984, Cl. 15-321.

Antoma (Hairdressing) Company Limited: *See—*
Robinson, Thomas, 3,665,275.

Aoki, Yasuo, to Kabushiki Kaisha Komatsu Seisakusho (Komatsu Ltd.). High pressure gear pump. 3,664,777, Cl. 418-131.

Applequist, Quintin A.: *See—*
Pendergrass, Buford; Applequist, Quintin A.; and Snyder, Alan Howard, Jr.,3,664,717.

Applequist, Roy A.; and Wilson, Laurence M., to Memorex Corporation. Ceramic transducer with metallic plugs to facilitate mounting. 3,665,434, Cl. 340-174.1

Application Engineering Corporation: *See—*
Morin, Joseph Cecil, 3,664,640.
Morin, Joseph Cecil, 3,664,641.
Morin, Joseph Cecil, 3,664,642.

Applied Motors, Inc.: *See—*
Means, William A., 3,665,502.

Archer, Lee A., to Erdco Engineering Corporation. Variable pitch coil filaments providing uniform temperature throughout. 3,665,240, Cl. 313-344.

Arima, Hideki: *See—*
Murakami, Masuo; Iwanami, Masaru; Kubo, Kazuo; Sano, Kenji; Kochiya, Masahiro; and Arima, Hideki,3,665,037.

Arjani, Farouk D.; Campbell, Kenneth C.; and Smeins, Craig B., to Intercontinental Systems, Inc. Margin control apparatus with variable length margin zone. 3,664,479, Cl. 197-63.000

Armbrust, Herbert: *See—*
Goerth, Helmut; and Armbrust, Herbert,3,665,029.

Armco Steel Corporation: *See—*
Goudy, William E., 3,664,516.
Howard, Robert E., 3,664,074.

Armitage, John D., Jr.: *See—*
Alstad, John K.; Armitage, John D., Jr.; and Bate, Geoffrey,3,665,431.

Armor Elevator Company, Inc.: *See—*
Stichweh, James H.; Hornung, Stephen A.; and Duckwall, Paul, III, 3,665,223.

Armstrong Cork Company: *See—*
Brown, Milton G.; Ollinger, James C.; and Sienkiewicz, Joseph E., 3,665,177.

Armstrong, Louis B., to Pollution Engineering International, Inc. Apparatus and process to treat waste water for pollution control and industrial reuse. 3,664,951, Cl. 210-44.

Arnold, Thomas N. Connection joint for structural members. 3,664,077, Cl. 52-283.

Arthur, William C.: *See—*
Aweida, Jesse I.; Arthur, William C.; and Powers, Gale A.,3,664,604.

A/S Kyllingstad Plogfabrik: *See—*
Bo, Isak T., 3,664,433.

Asahi Dow Limited: *See—*
Nakanishi, Atsuo; Izawa, Shinichi; and Sato, Mikio, 3,664,977.

Asahi Glass Co., Ltd.: *See—*
Ishimatsu, Tsuyoshi; Ito, Takashi; Yano, Masamitsu; Takeda, Hajime; and Nagano, Kentaro, 3,664,765.

Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Seko, Maomi; Yomiyama, Agira; Takahashi, Yasunobu; Seta, Shigetoshi; and Nakagawa, Koji, 3,664,936.

Asakawa, Shigeo: *See—*
Murakami, Junzo; Asakawa, Shigeo; and Takeuchi, Kenji,3,665,460.

Asakawa, Yukichi. Apparatus and method for heating water. 3,665,153, Cl. 219-279.

Ashland Oil, Inc.: *See—*
Slagel, Robert C., 3,664,990.

Ashton, Stanley; and Nicholson, Eric Samuel, to Imperial Chemical Industries Limited. Manufacture of hexahydrotriazine stabilisers. 3,665,004, Cl. 260-248.0ns

Ashworth, Roger Anderton: *See—*
Blake, John Berchmans; and Ashworth, Roger Anderton,3,664,474.

Asker, Gunnar C. F.; and Hubscher, Maurice A. Exchange packing element. 3,664,095, Cl. 55-387.

Asker, Gunnar C. F.; and Hubscher, Maurice A. Conditioned air distribution system. 3,664,253, Cl. 98-36.

Assarsson, Per Gunnar, to Union Carbide Corporation. Disposable articles. 3,664,343, Cl. 128-284.

Assmus, Friedrich; and Ganter, Wolfgang, to Gebruder Junghans G.m.b.H., Firma. Driving circuit for a time-keeping device. 3,665,271, Cl. 318-138.000

Atkin, Wesley H., to Wenzel Company, The. Automatic stuffer for sleeping bags. 3,664,090, Cl. 53-258.

Atkiss, Thomas Clifford, to Pennwalt Corporation. Process for increasing corrosion resistance of conversion coated metal. 3,664,887, Cl. 148-6.16

Atlantic Richfield Company: *See—*
Fauber, Eugene M., 3,664,871.
Grane, Henry R.; and Katz, Isadore Edward, 3,665,048.
Ohlswager, Stanley, 3,665,033.

Atwater, Wayne G., to Triax Company, The. Storage frame components and assembly thereof into a storage rack for use in automatic ware- housing system. 3,664,513, Cl. 211-134.

Automatic Electric Laboratories, Inc.: *See—*
Kopec, Thomas J.; and Morstadt, Richard A., 3,665,107.

Automatic Toll Systems, Inc.: *See—*
Lopata, Herman, 3,665,160.

Autoscan, Inc.: *See—*
Pelta, Edmond R.; and Gold, Kenneth Stewart, 3,665,294.

Autry, Robert F., to Devro, Inc. Production of meat snack product and product. 3,664,849, Cl. 99-107.

Avco Corporation: *See—*
Benner, David E., 3,664,264.
Lucas, Edward J.; and Lafrance, Jean C., 3,664,268.

Averkiou, George: *See—*
Drozdowicz, Kenneth Paul; Fowler, William Rey; and Averkiou, George,3,665,266.

Aweida, Jesse I.; Arthur, William C.; and Powers, Gale A., to Storage Technology Corporation. Reel control system for magnetic tape apparatus. 3,664,604, Cl. 242-185.

Ayers, Peter John Henry, to T. V. Manufacturing Limited. Electric transducers for tension control in a wind- ing device. 3,665,270, Cl. 318-6.

Ayers, Ray R.; Titus, Paul E.; and Hanson, James R., to Shell Oil Company. Method and apparatus for deploying a floatable barrier. 3,664,504, Cl. 210-83.

Ayers, Robert C., Jr.: *See—*
Penberthy, Walter L.; Bayless, Jack H.; and Ayers, Robert C., Jr.,3,664,425.

Badische Anilin- & Soda-Fabrik Aktiengesellschaft: *See—*
Goerth, Helmut; and Armbrust, Herbert, 3,665,029.
Graefen, Hubert; and Kuron, Dieter, 3,664,831.
Trieschmann, Hans-Georg; Pfannmueller, Helmut; Gropper, Hans; Gierth, Volker; and Beck, Gilbert, 3,664,988.
Widder, Rudi; Distler, Harry; and Haug, Erwin, 3,664,864.

Baechle, Charles H. Power tool accessory. 3,664,614, Cl. 248-2.000

Baensch, Ulrich. Fish food holder. 3,664,303, Cl. 119-51.

Baglai, Vitaly Mikhailovich: *See—*
Paton, Boris Evgenievich; Lebedev, Vladimir Konstantinovich; Medovar, Boris Izrailevich; Pentegov, Igor Vladimirovich; Latash, Jury Vadimovich; Bondarenko, Oleg Petrovich; Baglai, Vitaly Mikhailovich; Podola, Nikolai Vasilievich; and Emelyanenko, July Georgievich,3,665,081.
Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Bondarenko, Oleg Petrovich; Latash, Jury Vadimovich; Baglai, Vitaly Mikhailovich; and Shirshov, Vladimir Grigorievich,3,665,488.

Bakel, Joseph F.; and Rogers, George L., to General Electric Company. Numerical control system for providing a constant rate of metal removal. 3,665,170, Cl. 235-151.11

Baker, James G., to Polaroid Corporation. Method and apparatus for generating surfaces of revolution. 3,664,065, Cl. 51-100.

Bakermans, Johannes C. W., to Berg Electronics, Inc. Method for mounting wire wrap pins on circuit boards. 3,664,015, Cl. 29-625.

Balchem Corporation: *See—*
Pasin, Z. Joseph, 3,664,963.

Baldeschwieler, John D. Labeling of molecules using the perturbed angular correlation of gamma radiation. 3,665,192, Cl. 250-71.500

Baldt Anchor and Chain Corporation: *See—*
Linnenbank, Charles D., 3,664,122.

Bales, Walter D., III; and Cosand, Neal H., to Hughes Aircraft Company. Overload current suppression circuit network. 3,665,250, Cl. 317-16.000

Ball, Geo. J., Inc.: *See—*
Danielson, Robert E., 3,664,062.

Ballenger, Carl H. Endless helical conveyer and belt. 3,664,487, Cl. 198-136.

Balve, Robert. Control arrangement for pneumatic hammers. 3,664,233, Cl. 91-290.

Bandle, James M.: *See—*
Fleming, James Evans; Lovell, Clarence A.; and Bandle, James M.,3,665,468.

Bannister, Brian, to Upjohn Company, The. Process for converting peracylated cis-glycosyl halides to peracylated trans-glycosyl halides and novel compounds. 3,664,998, Cl. 260-210.

Barker Manufacturing Co., Inc.: *See—*
Budrow, Jack C.; and Reed, Glenn A., 3,665,477.

Barkovitz, William E.; and Przygocki, Julius V., to American Standard Inc. Flow balancing restriction in gas scrubber. 3,664,094, Cl. 55-223.000

Barmag Barmer Maschinenfabrik Aktiengesellschaft: *See—*
Heinz, Schippers; and Hensen, Friedhelm, 3,664,795.
Lenk, Erich, 3,664,596.
Weber, Klaus; and Urbahn, Fritz, 3,664,111.

Barnett, Elben Ray; and Barnett, Raymond Ray, 1/4 to Hogg, Jerry D., and 1/4 jointly to Secondo Dalporte, and Gentile, Tony. Parallel direct current generators arrangement. 3,665,203, Cl. 307-84.

Barnett, Raymond Ray: *See—*
Barnett, Elben Ray; and Barnett, Raymond Ray,3,665,203.

Barr and Stroud Limited: *See—*
Ritchie, David S., 3,664,747.

Barr'e, Lester J. Dual wheel adaptor system. 3,664,709, Cl. 301-36.00r

Barron, Robert H. Apparatus for making shell molds. 3,664,407, Cl. 164-165.

Barstad, Gotfred E. B., to Norwegian Defence Research Establishment. Aircraft landing guidance system using collimated fan shaped radiation beams. 3,665,198, Cl. 250-106.

Barstow, Ormand E., to Dow Chemical Company, The. Valve assembly for injecting a liquid sample into an analyzing instrument. 3,664,194, Cl. 73-422.
Bartels, Harold, to Puritan-Bennett Corporation. Respiration system. 3,664,361, Cl. 137-98.
Barth Electronics, Inc.: *See—*
Barth, Jon E., 3,665,347.
Barth, Jon E., to Barth Electronics, Inc. T-Attenuator or coupling network having an identical characteristic impedance from either end. 3,665,347, Cl. 333-81.
Barto, Floyd D. Scriber. 3,664,025, Cl. 33-27.
Bass, Miles M., to Hammond Machinery Builders, Inc. Work holder for electrochemical abrading machine. 3,664,947, Cl. 204-297.
Bass, Sidney; Clarke, Charles D.; and Morse, James E., to Mattel, Inc. Electrical doll accessory. 3,664,055, Cl. 46-45.000
Bate, Geoffrey: *See—*
Alstad, John K.; Armitage, John D., Jr.; and Bate, Geoffrey,3,665,431.
Bates, William: *See—*
Moyle, Henry Dinwoodey, Jr.; and Bates, William,3,664,328.
Battelle Development Corporation, The: *See—*
Widman, Michael U., 3,664,781.
Bauer, Benjamin B., to United States of America, Navy. Movable coil bi-gradient transducer. 3,665,381, Cl. 340-8.
Baumoel, Joseph, to Controlotron Corporation. Golf computer. 3,665,494, Cl. 235-156.
Baumueller, Adam, GmbH Fabrik fur Elektrotechnik: *See—*
Wendler, Guenther, 3,665,231.
Baxter, Robert O.; Hollis, Clint R.; and Evans, Carlton F., to International Paper Company. Apparatus for making multi-ply paper bags. 3,664,238, Cl. 93-8.
Baychem Corporation: *See—*
Gier, Delta W., 3,664,822.
Bayless, Jack H.: *See—*
Penberthy, Walter L.; Bayless, Jack H.; and Ayers, Robert C., Jr.,3,664,425.
Penberthy, Walter L., Jr.; Bayless, Jack H.; and West, Robert C.,3,664,424.
Beagan, Michael A., Jr. Adjustable mounting for rock drills. 3,664,436, Cl. 173-43.
Beard, Albert L.; and Hunter, John C., to Honeywell Information Systems Inc., mesne. Data processing system with program interrupt priority apparatus utilizing working store for multiplexing interrupt requests. 3,665,415, Cl. 340-172.500
Beatrice Foods Co.: *See—*
LaWarre, Robert W., 3,664,779.
Beatty, Ronald L.; and Kiplinger, Dale V., to United States of America, Atomic Energy Commission. Pulsed method for impregnation of graphite. 3,664,859, Cl. 117-46.0cg
Beauchet, Jean, to Societe Nouvelle de Roulements. Method for machining bodies of revolution having a circular generatrix. 3,664,067, Cl. 51-289.
Beavitt, Alan Robert, to Square D Company, mesne. Reed switches. 3,665,349, Cl. 335-154.
Beck, Forrest E.: *See—*
Kelly, Jerry D.; and Beck, Forrest E.,3,664,962.
Beck, Gilbert: *See—*
Trieschmann, Hans-Georg; Pfannmueller, Helmut; Gropper, Hans; Gierth, Volker; and Beck, Gilbert,3,664,988.
Becker, Carl H.; Dell, Harold R.; McFarland, Keith E.; and Wong, Herman, to Chase Manhattan Capital Corporation, mesne. Laser recording medium. 3,665,483, Cl. 346-1.000
Becker, Joseph J., to General Electric Company. Permanent magnet material powders having superior magnetic characteristics. 3,664,892, Cl. 148-31.570
Becker, Stephen A.; and Knoop, Donald E., to Whirlpool Corporation. Heating system control. 3,665,159, Cl. 219-497.000
Becker, Werner: *See—*
Schobel, Karl; and Becker, Werner,3,665,147.
Beckman Instruments, Inc.: *See—*
Boronkay, Attila D., 3,665,215.
Beckwith, Hildreth C.: *See—*
Scanlon, Robert M.; and Beckwith, Hildreth C.,3,664,491.
Bedenk, William T.; and Purves, Edward R., to Procter & Gamble Company, The. Process of producing a soy-containing ready to eat breakfast cereal. 3,664,848, Cl. 99-83.000
Beech, Austin S., & Company Limited: *See—*
Beech, Austin Sidney; and Burrows, Roy, 3,664,470.
Beech, Austin Sidney; and Burrows, Roy, to Beech, Austin S., & Company Limited. Fluid controls with interlock for clutch and transmission. 3,664,470, Cl. 192-3.570
Beehler, Vernon D.: *See—*
Sawyer, Harold T., 3,664,021.
Beersma, Pieter Johannes Adrianus: *See—*
Dijkhuizen, Willem; and Beersma, Pieter Johannes Adrianus,3,664,863.
Beesley, Scott L. Cylindrical container storage construction. 3,664,545, Cl. 221-176.000
Behn, Reinhard; Preissinger, Karl-Heinz; and Simson, Reiner, to Siemens Aktiengesellschaft. Impregnated electrical capacitor. 3,665,268, Cl. 317-258.
Belden, Rex. Earth working and planting apparatus and method of planting seed. 3,664,279, Cl. 111-80.
Bell & Howell Company: *See—*
Burm, George C.; Henriksen, Elmer C.; and Mateja, Eugene V., 3,665,446.
Cooper, Dexter P., Jr., 3,665,118.
Bell Telephone Laboratories, Incorporated: *See—*
Bergman, John George, Jr.; and McFee, James Hoffman, 3,665,206.
Bobeck, Andrew Henry; Sherwood, Richard Curry; and Van Uitert, Le Grand Gerard, 3,665,427.
Bridenbaugh, Paul Michael; Carruthers, John Robert; and Nash, Franklin Richard, 3,665,205.
Courtney-Pratt, Jeofry Stuart, 3,665,237.
Frank, Gerard A.; Kipp, Karl F.; and Oswald, Donald R., 3,664,872.
Holland, John Rickman, 3,665,410.
Krambeck, Robert Harold, 3,665,214.
Mandrews, John Marshall, Jr., 3,665,218.
Maybach, Richard Lee, 3,665,304.
Morrow, John Phillip, 3,665,171.
Nelson, Donald Frederick, 3,665,204.
Orr, William H., 3,665,346.
Papadakis, Emmanuel P., 3,664,902.
Weischedel, Herbert Rudolf; and Westerman, George Raymond, 3,665,291.
Wickliff, Noble Ervin, 3,665,221.
Beltone Electronics Corporation: *See—*
Weiss, Erwin M., 3,665,121.
Weiss, Erwin M., 3,665,122.
Bendix Corporation, The: *See—*
Butler, Hymie, 3,665,499.
Deradorian, Bagdasar; Svenson, James; and Nalpka, Raymond, 3,665,497.
Ellis, John H., 3,665,368.
Glowzewski, Thomas L.; and Cutler, Hymie, 3,665,493.
Meyers, Robert E., 3,664,130.
Sanford, Norman R., 3,665,506.
Bendix-Westinghouse Automotive Air Brake Company: *See—*
Valentine, Harry M., 3,664,632.
Benichou, Marcel M., to L'Organisation Economique Moderne. Suspension bar for files or other similar objects. 3,664,051, Cl. 40-359.
Benner, David E., to Avco Corporation. Bi-directional fuze assembly. 3,664,264, Cl. 102-73.
Benning, Herman J.G.M.: *See—*
Roza, Engel; Benning, Herman J.G.M.; and Lommers, Anthonius J.J.C.L.,3,665,344.
Benson, Allen B.; and Hatley, Elbert Troy, to International Business Machines Corporation. Passive magnetic transfer of discrete magnetic information. 3,665,513, Cl. 346-74.00m
Berg, Edward J. Embroidery thread box. 3,664,719, Cl. 312-185.
Berg Electronics, Inc.: *See—*
Bakermans, Johannes C. W., 3,664,015.
Thoms, William C., 3,664,004.
Thoms, William C.; and Mancini, Lloyd, 3,665,375.
Bergman, John George, Jr.; and McFee, James Hoffman, to Bell Telephone Laboratories, Incorporated. Nonlinear devices. 3,665,206, Cl. 307-88.300
Bergomi, Joseph G., Jr.; Dill, Dale R.; and Graham, Paul R., to Monsanto Company. Resin blend containing ethylene/vinyl chloride interpolymer. 3,665,060, Cl. 260-897.00c
Bergqvist, Mats Soren; Kallstrom, Olof Krister; Lagerberg, Per Goran Olof; and Okvist, Nils Axel Gunnar, to Sandvikens Jernverks Aktiebolag. Method for manufacturing zirconium alloys and alloys manufactured according to the method. 3,664,825, Cl. 75-10.000
Berlin, Herbert: *See—*
Schubert, Bernhard; Schubert, Alfred; and Berlin, Herbert,3,664,891.
Berrie, Alistair Howard; and Hughes, Nigel, to Imperial Chemical Industries Limited. Mono azo dyestuffs containing a pyridyl group. 3,664,996, Cl. 260-156.
Berry, James I., to Ford Motor Company. Vehicle speed synthesizer. 3,664,711, Cl. 303-21.0be
Bertram, Claus: *See—*
Wilke, Heinz; and Bertram, Claus,3,664,012.
Besson, Rene, to Ebauches S.A. Calendar electric timepiece. 3,664,119, Cl. 58-58.000
Betcher, Alexandr Samuilovich: *See—*
Tatianko, Nikolai Vasilievich; Tsymbal, Alexandr Gavrilovich; Stetsenko, Vladimir Vasilievich; Isikov, Sergei Alexandrovich; Rodenko, Fedor Leontievich; Betcher, Alexandr Samuilovich; Shamrai, Petr Dmitrievich; Dulya, Mikhail Afanasievich; Dudka, Viktor Vasilievich; Klimchuk, Ivan Petrovich; and Dolgov, Anatoly Mikhailovich,3,664,431.
Bethlehem Steel Corporation: *See—*
Leonard, Regis J.; and Ulmer, Gene C., 3,664,853.
Betts, Max W.; and Robinson, Frank, to Courtaulds Limited. Garment and method of making it. 3,664,156, Cl. 66-176.
Betz Laboratories, Inc.: *See—*
Shema, Bernard F.; Brink, Robert H., Jr.; and Swered, Paul, 3,664,821.
Beusman, Curtis C., to Curtis Instruments, Inc. Package for an electrochemical elapsed time meter. 3,665,308, Cl. 324-182.

Beveridge, Robert W.; and Macaluso, Felix, to Ricca Data Systems, Inc. Apparatus for reading optically cardlike elements and a merchandising system utilizing the same. 3,665,164, Cl. 235-61.11

Beverly, Rheinhardt J. Multi-purpose bobber. 3,664,053, Cl. 43-43.14

Bezgodova, Ljudmila Ivanovna: *See*—
Khusid, Iosif Efimovich; Bezgodova, Ljudmila Ivanovna; and Ruben, Mara Khugovna,3,664,999.

Bezu, Maurice, to Societe d'Etudes et de Realisations Electroniques. Device for automatically setting the initial heading aboard craft utilizing gyroscopic navigation systems. 3,664,748, Cl. 356-152.

Bidwell, Dennis P.; Davies, Douglas R.; Hanley, John T., Jr.; Hart, William K.; Henderson, Thomas A.; Lovell, Thomas W.; and Fogg, Lloyd C. Method and apparatus for preventing inebriated persons from operating vehicles. 3,665,447, Cl. 340-279.000

Bierbaum, Dieter: *See*—
Martini, Karl; Forster, Peter; Bierbaum, Dieter; and Halm, Gunther,3,664,472.

Biheller, Hans J., to Worthington Corporation. Self adjusting backflow preventor for centrifugal pumps. 3,664,759, Cl. 415-121.000

Bijl, Aart: *See*—
Spaargaren, Klaas; and Bijl, Aart,3,665,172.

Binovec, Ladislav: *See*—
Florian, Jaroslav; and Binovec, Ladislav,3,664,488.

Bio-Logics, Inc.: *See*—
Lindsey, Joseph W.; and Murphy, Larry O., 3,664,337.

Bird Machine Company: *See*—
Nichols, George E., Jr., 3,664,502.

Birmingham Small Arms Company Limited, The: *See*—
Marshall, Alec Frank; and Taylor, Hugh Gordon, 3,664,785.

Bishop, James S., to General Electric Company. Generator end winding support. 3,665,234, Cl. 310-260.

Blackburn, Jack. Methods for producing pavement-like sites. 3,664,241, Cl. 94-10.

Blackmon, John G., to Carolina Products, Inc. Purge apparatus for refrigeration system. 3,664,147, Cl. 52-85.000

Blair, Boyd C., to Brackett Stripping Machine Co., Inc. Sheet working machine and feed control apparatus therefor. 3,664,220, Cl. 83-170.

Blake, John Berchmans; and Ashworth, Roger Anderton, to Allspeeds Holdings Limited. Torque transmitting devices. 3,664,474, Cl. 192-56.00f

Blake, Richard K.; De Hilster, Robert J.; and Porter, Warren Wesley, to North Electric Company. Telephone repertory dialer. 3,665,113, Cl. 179-90.

Blake, Richard K.; and Jotwani, Haresh C., to North Electric Company. Multi-line telephone set with switching capability. 3,665,112, Cl. 179-99.000

Blodgett, William Edward: *See*—
Wallick, Claude Rollin, Jr.; Blodgett, William Edward; and Lazor, Donald Keith,3,664,799.

Bo, Carlo, to Ansaldo Meccanico-Nucleare S.p.A. Collection heat exchangers for gaseous fluids in general, particularly heaters of burning air for steam heaters in marine and land installations. 3,664,413, Cl. 165-4.000

Bo, Isak T., to A/S Kyllingstad Plogfabrik. Stabilizer means for plow with steerable tailwheel. 3,664,433, Cl. 172-450.000

Bobeck, Andrew Henry; Sherwood, Richard Curry; and Van Uitert, Le Grand Gerard, to Bell Telephone Laboratories, Incorporated. Magnetic devices utilizing garnet compositions. 3,665,427, Cl. 340-174.0tf

Bochmann, Karlheinz, to Siemens Aktiengesellschaft. Method of data transmission. 3,665,395, Cl. 340-146.1

Bock, Helmuth: *See*—
Gerke, Peter; Rutkowski, Karl; Bock, Helmuth; and Palsa, Helmut,3,665,110.

Bock, Robert V.: *See*—
Rehhausser, Frederick V.; Earnest, Elmer Dean; Bock, Robert V.; Gerbstadt, Frederick H.; and Monek, James J.,3,665,421.

Bodenseewerk Perkin-Elmer & Co., GmbH: *See*—
Witte, Wolfgang; and Stenz, Herbert, 3,664,742.

Bodesheim, Ferdinand: *See*—
Kubitzek, Harry; Essig, Karl-August; Von Falkai, Bela; Reichle, Alfred; and Bodesheim, Ferdinand,3,664,914.

Boehringer Mannheim GmbH: *See*—
Popelak, Alfred; Lerch, Ansgar; Stach, Kurt; Roesch, Egon; and Hardebeck, Klaus, 3,665,002.

Boeing Company, The: *See*—
Skidmore, Wallace E.; Syltebo, Bjarne E.; and Viall, Wilton S., 3,664,612.

Boering Company, The: *See*—
Mulkey, Owen R.; Kleingartner, Charles A.; and Zoutte, Arnold A., 3,665,458.

Boersma, Rintje; and Irik, Gijsbert Waldemar, to N.V. 'COQ'. Metal clad isolator switches for high tension and double interruption. 3,665,135, Cl. 200-163.

Boetto, Charles: *See*—
Connor, Donald E.; and Boetto, Charles,3,664,434.

Bogachenko, Alexsey Georgievich: *See*—
Medovar, Boris Izrailevich; Latash, Jury Vadimovich; Bondarenko, Oleg Petrovich; and Bogachenko, Alexsey Georgievich,3,665,080.

Bogoroditsky, Alexandr Alexandrovich; Ryzhevskaya, Tamara Nikolaevna; Ryzhevsky, Alexei Gordeevich; and Shlyandin, Viktor Mikhailovich. Method of and apparatus for analog-to-digital conversion of physical values and their ratios. 3,665,456, Cl. 340-347.

Bogue, John S.: *See*—
Sarbacher, Robert I., 3,664,144.

Bole, Hamilton B., to American Optical Corporation. Lens blocking apparatus. 3,663,983, Cl. 51-277.000

Bolla, Giovanni. Inductor applicable to electric furnaces for metal casting. 3,665,082, Cl. 13-26.000

Bondarenko, Oleg Petrovich: *See*—
Medovar, Boris Izrailevich; Latash, Jury Vadimovich; Bondarenko, Oleg Petrovich; and Bogachenko, Alexsey Georgievich,3,665,080.
Paton, Boris Evgenievich; Lebedev, Vladimir Konstantinovich; Medovar, Boris Izrailevich; Pentegov, Igor Vladimirovich; Latash, Jury Vadimovich; Bondarenko, Oleg Petrovich; Baglai, Vitaly Mikhailovich; Podola, Nikolai Vasilievich; and Emelyanenko, July Georgievich,3,665,081.
Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Bondarenko, Oleg Petrovich; Latash, Jury Vadimovich; Baglai, Vitaly Mikhailovich; and Shirshov, Vladimir Grigorievich,3,665,488.

Bonhote, Andre. Bathtub. 3,663,971, Cl. 4-173.000

Bonis, Henry M., Jr.: *See*—
Shulman, Arthur; and Bonis, Henry M., Jr.,3,664,281.

Bonjuk, Petr Veniaminovich: *See*—
Orlova, Frida Abramovna; Seleznev, Georgy Vasilievich; and Bonjuk, Petr Veniaminovich,3,664,885.

Bonnet, Jean-Loup: *See*—
Nicolas, Yves; and Bonnet, Jean-Loup,3,664,416.

Bonnet, Maurice; and Courtes, Georges, to Etablissement Public: Agence Nationale de Valorisation de la Recherche 'Anvar'. Method and devices for the chromatic analysis of an object. 3,664,741, Cl. 356-74.

Booker, Jasper A. Scooter-type vehicle. 3,664,680, Cl. 280-87.400

Booth, Frederick C., to Allied Chemical Corporation. Vehicle seat belt warning signal system. 3,665,385, Cl. 340-52.00e

Borg-Warner Corporation: *See*—
Clauss, Julius A., Jr., 3,664,206.

Borg-Warner Limited: *See*—
Laing, James Morrison, 3,664,210.

Born, Norman E.; Kolatorowicz, Edwin E.; and Plumb, Harry A., Jr., to General Electric Company. Reversible motor control having alternatively operative dual amplifiers and automatic response adjustment. 3,665,274, Cl. 318-257.000

Boronkay, Attila D., to Beckman Instruments, Inc. Pure nonlinear transfer circuit. 3,665,215, Cl. 307-230.

Bosch, Robert, GmbH: *See*—
Junker, Jurgen; and Schleupen, Richard, 3,664,945.
Vogel, Erich; and Ullmann, Gunther, 3,664,201.
Wilke, Heinz; and Bertram, Claus, 3,664,012.

Bosch, Robert, Photokino GmbH: *See*—
Riedel Wolfgang, 3,664,606.

Bossard, Fredrick R.: *See*—
Rogers, John A.; and Bossard, Fredrick R.,3,664,451.

Boswell, John E. E., Jr.; and Miner, Jesse H., to Schmoyer, Arthur R. Audio-visual teaching device and method for instruction in the operation of keyboard controlled instruments. 3,664,036, Cl. 35-6.

Boucher, Wilfred M.; Kurilla, John; and Slepp, Alice C., to International Paper Company. Surgical face mask. 3,664,335, Cl. 128-146.6

Bouligny, R. H., Inc.: *See*—
Wilson, Robert W., 3,664,034.

Bourdais, Jacques, to Centre National de la Recherche Scientifique. Aminoalkylthio indoles. 3,665,016, Cl. 260-268.0bc

Bouricius, Willard Gail; Carter, William Caswell; Roth, John Paul; and Schneider, Peter Robert, to International Business Machines Corporation. Status switching in an automatically repaired computer. 3,665,418, Cl. 340-172.500

Bouricius, Willard G.; Carter, William C.; Duke, Keith A.; Roth, John P.; and Schneider, Peter R., to International Business Machines Corporation. Error tolerant arithmetic logic unit. 3,665,174, Cl. 235-153.000

Bouricius, Willard G.; Carter, William C.; Roth, John P.; and Schneider, Peter R., to International Business Machines Corporation. Triple modular redundancy/sparing. 3,665,173, Cl. 235-153.000

Bouricius, Willard G.; Carter, William C.; Roth, John P.; and Schneider, Peter R., to International Business Machines Corporation. Dynamic storage address blocking to achieve error toleration in the addressing circuitry. 3,665,175, Cl. 235-153.000

Bowcott, Roy Price, to Lucas, Joseph, (Industries) Limited. Dynamo electric machines. 3,665,233, Cl. 310-234.

Bowden, George F.: *See*—
Maynen, James D.; and Bowden, George F.,3,664,630.

Bower, Exil E. Lateral adjustment means for radial arm saws. 3,664,389, Cl. 143-6.00a

Bowers, John O., Jr., to General Dynamics Corporation. Multiplexing systems. 3,665,108, Cl. 179-15.0bl

Bowser, John O., to Aluminum Company of America. Insulation support. 3,664,079, Cl. 52-479.

Boydston, Edward A. Hydraulic jump captured air bubble vessel. 3,664,289, Cl. 114-67.

Brackett Stripping Machine Co., Inc.: *See*—
Blair, Boyd C., 3,664,220.

Brailsford, Harrison D. Vibration transducer for burglar alarms and the like. 3,665,259, Cl. 317-144.

Bran & Lubbe: *See*—
Lieckfeld, Werner, 3,664,072.

Brand, John R.; and Smith, Ernest A., to Warwick Electronics Inc. Keyer circuit for an electronic musical instrument wherein a single switch may actuate a single note or a chord. 3,665,088, Cl. 84-1.010

Brandstrom, Arne Elof; and Carlsson, Stig Ake Ingemar, to Aktiebolaget Haesle. Certain benzofuran derivatives useful for relief of pain, inflammation, pyresis and tussive irritation. 3,665,074, Cl. 424-248.

Brandt, Fritz; and Ernst, Wolfram, to Siemens Aktiengesellschaft. Program controlled data processing installation for switching a telephone exchange. 3,665,510, Cl. 340-172.5

Branum, Lonnie J. Vibration dampening clamp for electrical transmission and distribution lines. 3,664,620, Cl. 248-63.000

Brecht, William F., Jr. Valve. 3,664,378, Cl. 137-635.000

Breetvelt, Emile, to Intermenua (Proprietary) Limited. Shearing machines. 3,664,221, Cl. 83-196.000

Brefka, Paul E.: *See*—
Latham, Peter A.; and Brefka, Paul E.,3,664,669.

Bremer, Georg Fritz, to Dymo Industries, Inc. Compact embossing tool. 3,664,477, Cl. 197-6.7

Breslow, Jeffrey D.: *See*—
Glass, Marvin I.; Breslow, Jeffrey D.; and Jaworski, Eugene,3,664,670.

Bresson, Richard J.; and Painton, Richard C., to Eastman Kodak Company. Camera apparatus for controlling diaphragm and shutter speed. 3,664,245, Cl. 95-10.0cd

Bretschneider, Hermann; Klotzer, Wilhelm; and Franzmair, Rudolf, to Hoffmann-La Roche Inc. 1-Substituted-2-iminopyrrolidines, intermediates therefor and processes for the preparation thereof. 3,665,012, Cl. 260-326.300

Briand, Roger H., to Compagnie Internationale pour l'Informalique. Numerical data multi-processor system. 3,665,412, Cl. 340-172.5

Bridenbaugh, Paul Michael; Carruthers, John Robert; and Nash, Franklin Richard, to Bell Telephone Laboratories, Incorporated. Modified $LiNbO_3$ composition devices utilizing same. 3,665,205, Cl. 307-88.300

Bridgeman, Richard C.; and Gajewski, Wieslaw, to Vapor Corporation. Portable dew point hygrometer. 3,664,177, Cl. 73-17.00a

Bridger, Robert F., to Mobil Oil Corporation. Process for preparing carbon-carbon coupled dimers of N-arylnaphthylamines. 3,665,038, Cl. 260-576.000

Bridgestone Tire Company Limited: *See*—
Maruyama, Hideyo, 3,664,490.
Onishi, Akira; Fujio, Ryota; and Kojima, Minoru, 3,665,062.

Brieske, Bernard F. Inflatable plastic structures. 3,664,058, Cl. 46-90.

Brink, Robert H., Jr.: *See*—
Shema, Bernard F.; Brink, Robert H., Jr.; and Swered, Paul,3,664,821.

British Iron and Steel Research Association, The: *See*—
Hyde, Eric Ambrose, 3,664,702.

British Lighting Industries Limited: *See*—
Mc Lintic, William James, 3,665,179.

British Steel Corporation: *See*—
Mc Leman, Alexander D., 3,665,202.

Britt, A. D.; and Moniz, William B., to United States of America, Navy. Preparation of silicon-fluoride silicones. 3,664,985, Cl. 260-46.50r

Brittingham, Charles J. Oil collection device. 3,664,505, Cl. 210-242.000

Brockelsby, Norman D.: *See*—
Perry, Max W.; and Brockelsby, Norman D.,3,664,556.

Brocklehurst, Charles E., to Riegel Textile Corporation. Self-aligning slitting apparatus for traveling webs. 3,664,223, Cl. 83-368.

Brockmann & Bundt Industrie-Ofenbau: *See*—
Brockmann, Heinz, 3,664,649.

Brockmann, Heinz, to Brockmann & Bundt Industrie-Ofenbau. Furnace having structure for feeding work through a heat tunnel. 3,664,649, Cl. 263-6.

Broderick, Rory Wilson, to Institute for Industrial Research and Standards, and Thompson, Norman John. Aerosol containers and valves thereof. 3,664,548, Cl. 222-61.

Brody, Bruce S.: *See*—
Brody, Irwin L.; and Brody, Bruce S.,3,664,705.

Brody, Irwin L.; and Brody, Bruce S., to Spencer-Mitchell Co., The. Cardboard chairs. 3,664,705, Cl. 297-445.000

Brooks, William Thomas. Non-voltage sensitive indicator light. 3,665,442, Cl. 340-248.00r

Brown and Williamson Tobacco Corporation: *See*—
Russell, Frederick, 3,664,351.

Brown, Frank: *See*—
Tell, Mayo B.; Kidd, Donald D.; Wickham, William T.; and Brown, Frank,3,664,382.

Brown, Gaylord W., to Koehring Company. Apparatus for controlling the sagging of a thermo- plastic synthetic plastic web being fed through a thermoforming machine. 3,664,791, Cl. 18-19.

Brown, Ivan H.: *See*—
Gordon, Reuben H.; and Brown, Ivan H.,3,664,327.

Brown, Milton G.; Ollinger, James C.; and Sienkiewicz, Joseph E., to Armstrong Cork Company. Shallow profile vaulted lighting module. 3,665,177, Cl. 240-9.

Brown, Morris E.: *See*—
Easterly, Donald O.; and Brown, Morris E.,3,664,605.

Brown, Omar L.; and Fraze, Ermal C., said Brown assor. to said Fraze. Easy-open tear strip reinforcing means. 3,664,543, Cl. 220-54.

Brown, Wilfred E., III: *See*—
Haroules, George G.; Brown, Wilfred E., III; Ewen, Harold I.; Lilley, Arthur E.; and Kodis, Ralph D.,3,665,467.

Brubaker, Robert F.: *See*—
Fish, Austin D.; Fisher, William G.; and Brubaker, Robert F.,3,663,975.

Bruce, Roger K., to Sterigard Corporation. Bistable safety dispensing valve for fluid dispensers. 3,664,557, Cl. 222-397.

Brummer, Hans; and Busch, Karl, to VDO Tachometer Werke. Operation supervision system for airplanes. 3,665,439, Cl. 340-183.

Brune, Werner; Schwartz, Gunter; Dull, Ernst Hermann; and Polly, Edgar, to Licentia Patent-Verwaltungs-G.m.b.H. Correcting errors in transmitted binary data. 3,665,393, Cl. 340-146.1

Bruner, Mates A. Removable watch band. 3,664,559, Cl. 224-4.

Brunner, Richard; and Mahon, Roger F., to American Standard, Inc. Flow meter device. 3,664,190, Cl. 73-194.000

Bruno, Gerald A.: *See*—
Haney, Thomas A.; and Bruno, Gerald A.,3,664,964.

Brunswick Corporation: *See*—
Gretsky, Anthony J., 3,664,392.
McLeod, David P. J.; and Gretzky, Anthony J., 3,664,393.

Brymill Corporation: *See*—
Bryne, Michael D., 3,664,344.

Bryne, Michael D., to Brymill Corporation. Tyned cryosurgical probe. 3,664,344, Cl. 128-303.100

Buchanan Electrical Products Corporation: *See*—
Haucke, Paul A.; Rosenfeld, Seymour; Schwab, Ronald W.; and Mazzeo, Charles F., 3,664,173.

Buchel, Karl-Heinz; Regel, Erik; Grewe, Ferdinald; Scheinpflug, Hans; and Kaspers, Helmut, to Farbenfabriken Bayer Aktiengesellschaft. N-trityl-imidazoles as plant fungicides. 3,665,078, Cl. 424-273.

Buchel, Karl Heinz; Regel, Erik; Grewe, Ferdinand; Scheinpflug, Hans; and Kaspers, Helmut, to Farbenfabriken Bayer Aktiengesellschaft. N-trityl-imidazoles as plant fungicides. 3,665,076, Cl. 424-273.

Buchel, Karl-Heinz; Regel, Erik; Grewe, Ferdinand; Scheinpflug, Hans; and Kaspers, Helmut, to Farbenfabriken Bayer Aktiengesellschaft. N-trityl-imidazoles as plant fungicides. 3,665,077, Cl. 424-273.

Buchel, Karl-Heinz; Regel, Erik; Grewe, Ferdinand; Scheinpflug, Hans; and Kaspers, Helmut, to Farbenfabriken Bayer Aktiengesellschaft. N-trityl-imidazoles as plant fungicides. 3,665,079, Cl. 424-273.

Buchtel, Dean H.; and Maurer, John A., to Weber Dental Manufacturing Company, The. Retriever for dental saliva ejector. 3,664,024, Cl. 32-22.

Buckeridge, Roger M., to Westinghouse Air Brake Company. Continuous ground monitoring circuit. 3,665,251, Cl. 317-18.

Buckley, Edward Z., to Udylite Corporation. Electroplating apparatus. 3,664,944, Cl. 204-212.

Budnik, Roger J.; Montgomery, Harold S.; and Nutting, David J., to Nutting Industries, Ltd. Instruction device with a plurality of modes. 3,664,037, Cl. 35-9.

Budrow, Jack C.; and Reed, Glenn A., to Barker Manufacturing Co., Inc. Elevatable and foldable antenna. 3,665,477, Cl. 343-714.

Budzynski, Leonard M.; and Leuck, Donald D., to Owens-Illinois, Inc. Switching circuits and method for resistor elements in conductor selection matrices. 3,665,401, Cl. 340-166.

Buettner, John H.: *See*—
Hawley, George F.; and Buettner, John H.,3,664,657.

Bugaut, Andree: *See*—
Kalopissis, Gregoire; and Bugaut, Andree,3,665,036.

Bull General Electric (Nederland) N.V.: *See*—
Keulen, Gerben Jan; and Kroes, Johannes Petrus, 3,664,658.

Bullen, Ronald S., to Dresser Industries, Inc. Well fracturing method employing a liquified gas and propping agents entrained in a fluid. 3,664,422, Cl. 166-283.000

Bumpous, William H. Automatic vehicle signal system. 3,665,391, Cl. 340-67.000

Bunker-Ramo Corporation, The: *See*—
Cripps, Jack, 3,665,371.
Gallagher, Frank William; and Casey, Richard C., 3,665,406.
Hall, Stanley Rylon; and Nichols, Thomas Gilbert, 3,665,512.

Burch, Homer A.; and Schwan, Thomas J., to Morton-Norwich Products, Inc. Resolution of L-dopa intermediate. 3,665,032, Cl. 260-519.

Burger, William H., to Kimberly-Clark Corporation. Process for producing panties. 3,663,962, Cl. 2-224.

Burgoon, Jack L., to Scott & Fetzer Company, The. Floor scrubbing machine. 3,663,985, Cl. 15-353.

Burk, Maksymilian, to TRW Inc. Recovery of alumina from aluminosilicates. 3,664,809, Cl. 23-141.000

Burleigh, John E.: *See*—
Uraneck, Carl A.; and Burleigh, John E.,3,664,978.

Burm, George C.; Henriksen, Elmer C.; and Mateja, Eugene V., to Bell & Howell Company. Apparatus for speaker actuated visual effects having mechanical display activation. 3,665,446, Cl. 340-261.

Burnett, James H.: *See*—
Suchomel, Michael; Tipton, William; and Burnett, James H.,3,665,441.

Burroughs Corporation: *See*—
Dreimanis, Herbert V.; Spisz, Albert S.; Merlino, Eugene L., Jr.; and Ellis, Jonas, 3,664,481.
Feldman, Osias, 3,665,492.
Rehhausser, Frederick V.; Earnest, Elmer Dean; Bock, Robert V.; Gerbstadt, Frederick H.; and Monek, James J., 3,665,421.
Werner, John R., 3,665,404.

Burrows, Harold George; and Ingham, Philip Brierley, to Imperial Chemical Industries Limited. Dyeable polyamides containing polystyrene sulfonic acid. 3,665,054, Cl. 260-857.

Burrows, Roy: *See—*
Beech, Austin Sidney; and Burrows, Roy,3,664,470.
Burtis, Wilson A.; and Omori, Thomas T. Articulated snowmobile vehicle. 3,664,446, Cl. 180-5.
Busch, Karl: *See—*
Brummer, Hans; and Busch, Karl,3,665,439.
Busch, Raymond W. Electric motor. 3,665,227, Cl. 310-46.000
Bussiere, Douglas: *See—*
Netti, Anthony; and Bussiere, Douglas,3,664,112.
Bussink, Jan, to Akzo, N.V. Poly (2,6-diphenylparaphenyleneoxide) fiber- reinforced silicone molding compositions. 3,665,051, Cl. 260-824.
Bustos, Rafael Thomas, to Southern Cross Industries, Inc. Adjustable merchandise support with spaced, molded shelves. 3,664,274, Cl. 108-144.
Buswell, Richard F.; Nicholas, Peter G.; and Olsson, William J., to United Aircraft Corporation. Self-regulating encapsulated fuel cell system. 3,664,873, Cl. 136-86.
Butler, Hymie, to Bendix Corporation, The. Feedrate servo control system. 3,665,499, Cl. 318-571.000
Butler, Thomas W. Tension-torsion testing machine. 3,664,182, Cl. 73-93.000
Butschko, Gerhard: *See—*
Weber, Paul; Ritzmann, Horst; and Butschko, Gerhard,3,664,650.
Butts, Edward E., to Clark Equipment Company. Food product quick freezing method and apparatus. 3,664,146, Cl. 62-63.000
Cade, Phillip J., to Electronics Corporation of America. Combustion control system. 3,664,803, Cl. 431-69.000
Cahill, Bonaventure B.; and Lyon, Wilfred W., to Ohmart Corporation, The. Beta-ray thickness gauge using a two energy level beta-ray source. 3,665,199, Cl. 250-106.
Calsilox S.A.: *See—*
Vrijma, Berend, 3,664,219.
Cameron, Ewen, to Columbia Broadcasting System Inc. Apparatus for continuous contact printing. 3,664,738, Cl. 355-87.
Camitz, Carl-Henning, to Romnas Burks Aktiebolag. Chain link. 3,664,121, Cl. 59-84.
Campagna, James V., Jr. Main strap around an amplifier with holding strap to hold guitar. 3,664,224, Cl. 84-1.01
Campbell, Curtis B.; and Grover, Ben L., to Utah State University. Dew point hygrometers. 3,664,192, Cl. 73-336.500
Campbell, Donald J.; Heffner, William J.; Jennings, Paul H.; and King, Jane E., to Honeywell Information Systems, Inc. Storage structure for management control subsystem in multiprogrammed data processing system. 3,665,487, Cl. 444-1.000
Campbell, John David, to Walker-Neer Manufacturing Co., Inc. Dual circulation bumper subs. 3,664,443, Cl. 175-293.
Campbell, Kenneth C.: *See—*
Arjani, Farouk D.; Campbell, Kenneth C.; and Smeins, Craig B.,3,664,479.
Campbell, Melvin L., to Collins Radio Company. Solenoid with multirate return spring. 3,665,353, Cl. 335-258.000
Campbell, Richard H., to Webster Electric Company, Inc. AVC system. 3,665,332, Cl. 330-29.
Campbell Soup Company: *See—*
Von Lersner, Wolf A., 3,664,555.
Canada Barrels & Kegs Limited: *See—*
Cressman, Fred D., 3,664,161.
Canadian Patents and Development Limited: *See—*
Capes, Charles E.; McIlhinney, Allan E.; and Coleman, Richard D., 3,665,066.
Gross, Harry, 3,665,296.
Meadus, Frederick W.; Puddington, Ira E.; and Okvist, Nils Axel Gunnar, 3,664,824.
Moody, Norman Frank, 3,665,191.
Canfield, Eugene Beach, to General Electric Company. Adaptively controlled position prediction system. 3,665,168, Cl. 235-150.2
Capes, Charles E.; McIlhinney, Allan E.; and Coleman, Richard D., to Canadian Patents and Development Limited. Beneficiation of coals. 3,665,066, Cl. 264-117.
Carborundum Company, The: *See—*
Chatterjee, Anil K.; and O'Grady, James R., 3,664,277.
Cardona, Hernando. Ophthalmoscope. 3,664,730, Cl. 351-6.
Carey Machine and Supply Company: *See—*
Carey, Paul P., 3,664,441.
Carey, Paul P., to Carey Machine and Supply Company. Concentric pipe drill string. 3,664,441, Cl. 175-215.000
Carl, Heinz, to Licentia Patent-Verwaltungs-G.m.b.H. Battery. 3,664,876, Cl. 136-160.
Carlsson, Stig Ake Ingemar: *See—*
Brandstrom, Arne Elof; and Carlsson, Stig Ake Ingemar,3,665,074.
Carns, Leroy J., to Singer Company, The. Finishing boring head. 3,664,755, Cl. 408-159.000
Caroleo, Steven J., to Emerson Electric Company. Electric heaters. 3,665,155, Cl. 219-335.000
Carolina Products, Inc.: *See—*
Blackmon, John G., 3,664,147.
Carothers, Olen E.; and Hinkle, Oliver E. Dispensing system for beverages and other liquids. 3,664,550, Cl. 222-129.2
Carpetech Corporation: *See—*
Anthony, Peter C.; Colt, James G.; and Fournarakis, Solon, 3,663,984.
Carrier Corporation: *See—*
Pilarczyk, Karol, 3,664,001.
Raleigh, William F., 3,664,414.
Carroll, Robert L. Low temperature heat transfer device. 3,664,143, Cl. 62-3.
Carruthers, John Robert: *See—*
Bridenbaugh, Paul Michael; Carruthers, John Robert; and Nash, Franklin Richard,3,665,205.
Carse, Clifford C. Control apparatus for fluid dispenser. 3,664,552, Cl. 222-144.5
Carter, Allie F. Chick feeder. 3,664,304, Cl. 119-61.
Carter, Clarence F., to Carter Engineering Company. Method and apparatus for feeding and compacting finely divided particulate material. 3,664,385, Cl. 141-12.000
Carter Engineering Company: *See—*
Carter, Clarence F., 3,664,385.
Carter, Robert; Amos, Ralph A.; and Gregory, Charles A., Jr., to Power Systems and Controls, Incorporated. No break power system. 3,665,495, Cl. 307-67.000
Carter, William Caswell: *See—*
Bouricius, Willard Gail; Carter, William Caswell; Roth, John Paul; and Schneider, Peter Robert,3,665,418.
Bouricius, Willard G.; Carter, William C.; Roth, John P.; and Schneider, Peter R.,3,665,173.
Bouricius, Willard G.; Carter, William C.; Duke, Keith A.; Roth, John P.; and Schneider, Peter R.,3,665,174.
Bouricius, Willard G.; Carter, William C.; Roth, John P.; and Schneider, Peter R.,3,665,175.
Cartier, Michael David: *See—*
Olyphant, Murray, Jr.; Cartier, Michael David; and Freeman, Charles Robert,3,665,428.
Cartridge Television, Inc.: *See—*
Hathaway, Richard A., 3,665,114.
Larkin, Thomas J., 3,665,120.
Carver, Bryan George; and Crooks, Ronald, to G.K.N. Group Services Limited. Die-casting apparatus with ceramic shot duct liner. 3,664,411, Cl. 164-312.
Cary, John T., to Continental Can Company, Inc. Controlled cutting force assembly. 3,664,229, Cl. 90-18.
Cas, Inc.: *See—*
Pope, Kenneth E., 3,665,438.
Case, Laura K., to Itek Corporation. Tanning process for forming a photographic relief image. 3,664,836, Cl. 96-35.
Casey, Richard C.: *See—*
Gallagher, Frank William; and Casey, Richard C.,3,665,406.
Caterpillar Tractor Co.: *See—*
Zastrow, Virgil A., 3,664,761.
Cates, John D., Jr. Liquid dispensing device. 3,664,387, Cl. 141-238.
Catlin, Francis D., to Hardinge Brothers, Inc. Automatic machine tool control mechanism. 3,663,999, Cl. 29-44.
C.A.V. Limited: *See—*
Drori, Moshe, 3,664,773.
Cava Industries: *See—*
Hollander, Edward F., Jr., 3,664,813.
Cegedur GP: *See—*
Patrie, Jos, 3,664,932.
Celanese Corporation: *See—*
Watson, George A., 3,664,115.
Central Specialties Co.: *See—*
Rotheiser, Jordan I., 3,664,466.
Centre National de la Recherche Scientifique: *See—*
Bourdais, Jacques, 3,665,016.
Cerberus AG: *See—*
Gnagi, Alex; and Muller, Peter, 3,665,461.
Cerny, Harry E.: *See—*
Speransky, Jaroslav; and Cerny, Harry E.,3,665,232.
Ceskoslovensky uranovy prumysl oborovy podnik: *See—*
Mares, Vladimir, 3,664,486.
CFSI Steel Corporation: *See—*
Richardson, James H., Jr., 3,664,601.
Chadha, Rajendra Nath; and Pande, Kailash Chandra, to Stauffer-Wacker Silicone Corporation. Room temperature curing organopolysiloxane elastomers. 3,664,997, Cl. 260-185.
Chaney, Preston E., to Sun Oil Company. Offshore storage system. 3,664,286, Cl. 114-0.5
Channing, Derek, to Lucas, Joseph, (Industries) Limited. Internal combustion engine gasoline injection system. 3,664,319, Cl. 123-140.0mc
Chant, Leonard H., to Euclid, Inc. Exhaust diverting valve for dumpable vehicles having heated dump bodies. 3,664,706, Cl. 298-1.
Chantiers Navals de la Ciotat: *See—*
Zucca, Marc Edouard; and Filippi, Jean-Paul, 3,664,123.
Chapman, Gerald W.: *See—*
Cuckson, Kenneth; and Chapman, Gerald W.,3,664,900.
Chase Manhattan Capital Corporation: *See—*
Becker, Carl H.; Dell, Harold R.; McFarland, Keith E.; and Wong, Herman, 3,665,483.
Chase, Robert A.: *See—*
Iwanciow, Bernard L.; and Chase, Robert A.,3,664,133.
Chatterjee, Anil K.; and O'Grady, James R., to Carborundum Company, The. On-site incinerator. 3,664,277, Cl. 110-8.
Chenevert, Martin E., to Esso Production Research Company. Hydraulic fracturing method. 3,664,426, Cl. 166-308.000

Chestnut, Benjamin F.; and Stafford, Richard W., to Mallory, P. R., & Co., Inc. Drive means with variable outputs. 3,664,198, Cl. 74-3.540
Chevron Research Company: *See—*
Jaffe, Joseph, 3,664,971.
Jaffe, Joseph, 3,664,972.
Jaffe, Joseph, 3,664,973.
Childress, Allen M., Jr. Portable grooming kit. 3,664,353, Cl. 132-79.
Chilman, John Alfred, to Dowty Rotol Limited. Variable-pitch bladed rotors. 3,664,763, Cl. 416-157.
Chiola, Vincent; and Dodds, Phyllis R., to Sylvania Electric Products Inc. Group VI-B transition metal-amino- phosphorodithioates in lubricating oil. 3,664,954, Cl. 252-32.7
Chiou, Jia-Fa. Dismountable hibachi construction. 3,664,321, Cl. 126-9.00r
Chisso Corporation: *See—*
Ando, Masao, 3,665,154.
Choate, Wallace W.; and Amendola, Norman A., to Gerber Products Company. Container positioning machine. 3,664,087, Cl. 53-163.
Chouinard, Joseph Henry. Lawn mower attachment. 3,664,099, Cl. 56-13.3
Chowning, John M., to Leland Stanford Junior University, The board of trustees of the. Method and apparatus for simulating location and movement of sound. 3,665,105, Cl. 179-1.
Chramiec, Mark A.: *See—*
Walsh, George M.; and Chramiec, Mark A.,3,665,413.
Christofilos, Nicholas C., to United States of America, Atomic Energy Commission. Proton E-layer astron for producing controlled fusion reactions. 3,664,921, Cl. 176-4.
Ciba-Geigy Corporation: *See—*
Denss, Rolf; Clauson-Kaas, Niels; and Ostermayer, Franz, 3,665,010.
Denss, Rolf; Clauson-Kaas, Niels; and Ostermayer, Franz, 3,665,011.
Peterli, Hans Jakob; Keller, Ernst; and Schwarzenbach, Kurt, 3,665,031.
Cincinnati Milacron Inc.: *See—*
Hasz, John R., 3,664,228.
Cizek, Arthur: *See—*
Rice, Herbert L.; Cizek, Arthur; and Thaemar, Marvin O.,3,665,035.
C. Keller u. Co.: *See—*
Keck, Dieter, 3,664,089.
Clark, Chester G.: *See—*
Minbiole, Louis J., Jr.; Clark, Chester G.; and Neumann, John W.,3,664,354.
Clark, Clyde C., to TRW Inc. Apparatus for melting titanium. 3,665,083, Cl. 13-26.
Clark Equipment Company: *See—*
Butts, Edward E., 3,664,146.
Hunter, Calvin W., 3,664,534.
Short, Ralph H., 3,664,527.
Snyder, James H., 3,664,126.
Clark, Robert H., to King-Seeley Thermos Co. Barbecue grill assembly. 3,664,322, Cl. 126-25.
Clark, Stephen C., Jr., to Ingersoll Milling Machine Company, The. Method and apparatus for aligning workpieces. 3,664,066, Cl. 51-165.
Clarke, Charles D.: *See—*
Bass, Sidney; Clarke, Charles D.; and Morse, James E.,3,664,055.
Clauson-Kaas, Niels: *See—*
Denss, Rolf; Clauson-Kaas, Niels; and Ostermayer, Franz,3,665,010.
Denss, Rolf; Clauson-Kaas, Niels; and Ostermayer, Franz,3,665,011.
Clauss, Julius A., Jr., to Borg-Warner Corporation. Accessory drive mechanism. 3,664,206, Cl. 74-230.17
Clauss, Richard J., to Udylite Corporation. Process for acid copper plating of zinc. 3,664,933, Cl. 204-38.00s
Clayton, David W.; and Sakai, Asahi, to Pulp and Paper Research Institute of Canada. Vapor phase pulping of water saturated lignocellulosic materials. 3,664,918, Cl. 162-19.000
Clayton, David W.; and Sakai, Asahi, to Pulp and Paper Research Institute of Canada. Vapor phase polysulphide liquid pulping of lignocellulosic materials. 3,664,919, Cl. 162-19.000
Cleary, James W., to Phillips Petroleum Company. Cyclohexylene polyester dye receptors. 3,665,056, Cl. 260-873.
Clough, Roy L., Jr.: *See—*
Snow, John F.; and Clough, Roy L., Jr.,3,664,647.
Cluett, Peabody & Co., Inc.: *See—*
McFalls, Richard J., 3,664,283.
Wagar, Albert E., 3,664,282.
Cobb, Harold W., to Dennison Manufacturing Company. Heated corona charging unit. 3,665,181, Cl. 250-49.57
Cobey, Herbert T. Compost and refuse shredding and shifting apparatus. 3,664,645, Cl. 259-183.
Cocca, Frank J., to United States of America, National Aeronautics and Space Administration. Method and apparatus for detecting surface ions on silicon diodes and transistors. 3,665,307, Cl. 324-158.
Codex Corporation: *See—*
Forney, George David, Jr., 3,665,396.
Codina, Jorge G. Accelerometer. 3,664,196, Cl. 73-517.00b
Coffey, Horace D. Tree cutting and piling apparatus. 3,664,391, Cl. 143-32.
Cohen, Harvey M.: *See—*
Sioui, Richard H.; and Cohen, Harvey M.,3,664,819.
Cohen, Margalit; and Mac Phee, Kenneth E., to Uniroyal, Ltd. Phosphorus containing polymers. 3,664,974, Cl. 260-2.
Coker, Jesse E.: *See—*
Galli, Guido; and Coker, Jesse E.,3,664,867.
Coleco Industries, Inc.: *See—*
Reiner, Norbert L., 3,664,760.
Coleman, Richard D.: *See—*
Capes, Charles E.; McIlhinney, Allan E.; and Coleman, Richard D.,3,665,066.
Colgate-Palmolive Company: *See—*
Suh, John T.; and Schnettler, Richard A., 3,665,006.
Collard, Jacques Roger; Narayan, Subrahmanyam Yegna; and Paczkowski, John Paul, to RCA Corporation. Semiconductor diode. 3,665,254, Cl. 317-234.00r
Collins Radio Company: *See—*
Campbell, Melvin L., 3,665,353.
Hemmer, William R., 3,665,470.
Leuck, Carl A.; and Schindelbeck, Fritz H., 3,665,358.
Peterson, Max E., 3,665,323.
Stover, Harris A., 3,665,380.
Collins, Stuart A., Jr.: *See—*
Toth, Louis S.; and Collins, Stuart A., Jr.,3,664,723.
Colt, James G.: *See—*
Anthony, Peter C.; Colt, James G.; and Fournarakis, Solon,3,663,984.
Columbia Broadcasting System Inc.: *See—*
Cameron, Ewen, 3,664,738.
Combustion Engineering, Inc.: *See—*
Diwinsky, Gordon A.; and Kosky, Richard P., 3,664,922.
Krawiec, Donald M., 3,664,924.
Cominco Ltd.: *See—*
White, Arnold George; Smith, Thomas Edward; Work, Lyall Campbell; and Miller, Willard Wallace, 3,664,929.
Commissariat a l'Energie Atomique:*See—*
Germond, Jean-Claude; Guilbaud, Jean-Pierre; and Vertut, Jean, 3,664,517.
Lavigne, Pierre, 3,663,966.
Commissariat a l'Energie Atomique et Societe:*See—*
Meneret, Jean, 3,664,651.
Communications Patents Limited: *See—*
Gargini, Erich J., 3,665,311.
Compagnie de Saint-Gobain: *See—*
Parnet, Bernard, 3,664,520.
Compagnie des Ateliers et Forges de la Loire: *See—*
Gay, Pierre, 3,664,166.
Compagnie Electro-Mecanique: *See—*
Hugot, Andre Albert, 3,665,235.
Compagnie Francaise de Raffinage: *See—*
Gislon, Andre; Weisang, Joseph-Edouard; and Maurin, Jean, 3,665,047.
Compagnie Generale des Etablissements Michelin raison sociale Michelin & Cie: *See—*
Lejeune, Daniel, 3,664,000.
Montagne, Jean B., 3,664,402.
Verdier, Henri, 3,664,708.
Compagnie Internationale pour l'Informalique:*See—*
Briand, Roger H., 3,665,412.
Componentry Research and Development Enterprise, Inc.: *See—*
Raskin, Archie, 3,664,616.
Compufoto, Inc.: *See—*
Nielsen, Asger T., 3,665,453.
Computer Transmission Corporation: *See—*
Sanders, Ray W.; Keyes, Neil T.; and Quan, William, 3,665,405.
Concept, Inc.: *See—*
Naylor, Richard Norman, 3,664,329.
Concept Research Corporation: *See—*
Underwood, Lee D., 3,664,884.
Conklin, Joseph P., to Pitney-Bowes, Inc. Available light illuminated instrument read-out. 3,664,445, Cl. 177-45.000
Conklin, Roland H. Door mat. 3,663,980, Cl. 15-215.
Conley, Grant W.: *See—*
Stoddard, Robert D.; Schumacher, Arnold; Conley, Grant W.; and Williams, Roy M., Jr.,3,665,454.
Connolly, Thomas J. Fast neutronic reactor utilizing plutonium 240 fuel. 3,664,923, Cl. 176-40.
Connor, Donald E.; and Boetto, Charles, to International Harvester Company. Quick attachable planter disk depth drums. 3,664,434, Cl. 172-536.000
Conrad, Charles F.; and Dadd, Kieth L., to Thermotron Corporation. Floor structure for a test chamber. 3,664,181, Cl. 73-71.600
Conrad, Martin B. Tubing anchor and catcher. 3,664,417, Cl. 166-216.
Container Corporation of America: *See—*
Woelbel, Wilhelm, 3,664,239.
Continental Can Company, Inc.: *See—*
Cary, John T., 3,664,229.
Mascia, Carmen T., 3,664,496.
Mascia, Carmen T., 3,664,497.
Continental Gummi-Werke Aktiengesellschaft: *See—*
Twardzik, Georg, 3,664,404.
Continental Instruments Corporation: *See—*
Tellerman, Edward M., 3,664,247.

Continental Machines, Inc.: *See—*
Mills, Albert D.; and Ruhland, Walter F., 3,664,776.
Continental Oil Company: *See—*
Gordon, Ronnie D., 3,664,966.
Contraves AG: *See—*
Schoen, Kurt, 3,665,295.
Controlotron Corporation: *See—*
Baumoel, Joseph, 3,665,494.
Conzinc Riotinto of Australia Limited: *See—*
Worner, Howard Knox, 3,664,828.
Cook, Frederick D.: *See—*
Gaines, Jerry L.; Ebert, Paul J.; Mancebo, Lloyd; and Cook, Frederick D.,3,665,236.
Cook, Richard L., to Marshall Industries. Self-sealing structure for use as a fluid barrier in containers. 3,664,904, Cl. 161-50.
Cooke Engineering Company: *See—*
Lancaster, Jesse F., 3,665,129.
Coombe, Ronald Alan: *See—*
Quayle, Joshua Creer; Greatrix, Graham Roland; and Coombe, Ronald Alan,3,664,306.
Cooper, Dexter P., Jr., to Bell & Howell Company. Control signal recording. 3,665,118, Cl. 179-100.2
Cooper, Kenneth, to Gullick Dobson Limited, Inc. Mine roof support control system. 3,664,138, Cl. 61-45.00d
Cooper, Willard. Food heating device. 3,665,491, Cl. 219-10.55
Cornelius, Edward B.; and Koester, David W., to Air Products and Chemicals, Inc. Dehydrogenating propane over chromia-alumina catalyst. 3,665,049, Cl. 260-683.3
Cosand, Neal H.: *See—*
Bales, Walter D., III; and Cosand, Neal H.,3,665,250.
Cosgrove, James F.: *See—*
McCain, William B.; and Cosgrove, James F.,3,664,655.
Cottrell, Samuel H., to White Farm Equipment Company. Deadman seat actuated brake. 3,664,454, Cl. 180-101.000
Cottrell, Samuel H.; and Montgomery, Sam R., to White Farm Equipment Company. Deadman seat actuated brake and handbrake construction. 3,664,453, Cl. 180-101.
Council, Malcolm N., to Gardner-Denver Company. Indexing means for drill rod storage rack. 3,664,439, Cl. 175-85.
Countess Mara, Inc.: *See—*
Weidlin von Boden, Alberto; and Enzian, Ernest, 3,664,288.
Courtaulds Limited: *See—*
Betts, Max W.; and Robinson, Frank, 3,664,156.
Courtes, Georges: *See—*
Bonnet, Maurice; and Courtes, Georges,3,664,741.
Courtney-Pratt, Jeofry Stuart, to Bell Telephone Laboratories, Incorporated. Image retaining panel impervious to ambient light. 3,665,237, Cl. 313-108.
Cowan, Ben. Pulp screening machine. 3,664,501, Cl. 209-273.000
Cox, Roger G.: *See—*
McDonald, Kent A.; and Cox, Roger G.,3,664,180.
Craig, Orlyn W.: *See—*
Roberts, Arthur S.; and Craig, Orlyn W.,3,665,212.
Crandell, Ralph R.: *See—*
Valle, Thomas, 3,664,006.
Creears, T. H., Corporation: *See—*
Webb, Robert M.; and Parry, Keith S., 3,665,209.
Cressman, Fred D., to Canada Barrels & Kegs Limited. Fiberglass processing tank. 3,664,161, Cl. 69-30.
Cresswell, Richard, to Marconi Company Limited, The. Tracking antenna with anti-backlash spring in gear train. 3,665,482, Cl. 343-765.000
Crimmins, Bruce: *See—*
Trefzger, Edwin W.; and Crimmins, Bruce,3,664,607.
Cripps, Jack, to Bunker-Ramo Corporation, The. Electrical connectors. 3,665,371, Cl. 339-90.
Crivii, Mircea: *See—*
Kelemen, Arpad; and Crivii, Mircea,3,665,498.
Crompton & Knowles Corporation: *See—*
Roberson, James H., 3,663,993.
Crooks, Donald D.: *See—*
McCarthy, William H.; Fenn, Raymond W., Jr.; and Crooks, Donald D.,3,664,889.
Crooks, Ronald: *See—*
Carver, Bryan George; and Crooks, Ronald,3,664,411.
Cross, Dennis Rowland; and Stephens, Edward, to Lucas, Joseph, (Industries) Limited. Full wave rectifier assemblies. 3,665,287, Cl. 321-8.
Crossley, Harry E.: *See—*
Haydon, Arthur W.; and Crossley, Harry E.,3,665,348.
Crow, Robert Palmer, to RCA Corporation. Sequential AGC system for signal receiver. 3,665,317, Cl. 325-319.
Cryodry Corporation: *See—*
Johnson, Ray M., 3,665,142.
CTS Corporation: *See—*
Hartman, Clinton W., 3,665,365.
Cuckson, Kenneth; and Chapman, Gerald W., to Rolls-Royce Limited. Method of treating a length of material. 3,664,900, Cl. 156-174.000
Culp, Gordon W.: *See—*
Lee, Henry L., Jr.; Culp, Gordon W.; and Ocumpaugh, David E.,3,663,965.
Cuneo, Ambrogio: *See—*
Sala, Sergio; Cuneo, Ambrogio; and Dabisch, Wolfgang,3,664,869.
Cupler, John A., II. Apparatus for conducting machining operations. 3,663,998, Cl. 29-26.00a
Curtis, Daniel L. Therapeutic shower head. 3,664,585, Cl. 239-222.210
Curtis Instruments, Inc.: *See—*
Beusman, Curtis C., 3,665,308.
Cutler, Hymie: *See—*
Glowzewski, Thomas L.; and Cutler, Hymie,3,665,493.
Cutter Laboratories, Inc.: *See—*
Emery, Byron E., 3,664,536.
Cvacho, Daniel S., to Reynolds Metals Company. Apparatus for and method of forming cup-shaped articles. 3,664,172, Cl. 72-350.
Dabbs, Clyde Harwell; and Neil, Hugh G. Surgical buttons. 3,664,345, Cl. 128-335.
Dabisch, Wolfgang: *See—*
Sala, Sergio; Cuneo, Ambrogio; and Dabisch, Wolfgang,3,664,869.
Dadd, Kieth L.: *See—*
Conrad, Charles F.; and Dadd, Kieth L.,3,664,181.
D'Agati, John R., to Preformed Line Products Company. Line tie. 3,664,010, Cl. 29-526.
Dahlgren, Harold P. Straight feed press. 3,664,261, Cl. 101-177.
Dai Nippon Insatsu Kabushiki Kaisha: *See—*
Shiozawa, Daiichi, 3,664,554.
Daicel Ltd.: *See—*
Takasu, Itaru; Higuchi, Masaru; and Hotta, Hiroshi, 3,665,015.
Tanaka, Atsushi; Kobayashi, Hiroomi; Kudo, Teizo; and Mikumo, Masatoshi, 3,665,057.
Dakin, Hayes O., Jr.: *See—*
Reese, Frank L.; and Dakin, Hayes O., Jr.,3,665,133.
D'Alelio, Gaetano F. Acrylic esters of halogenated acetylenic diols. 3,664,992, Cl. 260-89.500
D'Alelio, Gaetano F. Acrylic esters of halogenated acetylenic diols. 3,664,993, Cl. 260-89.500
Dalmau Guell, Jose Maria, to Jumberca, S.A. Needle bar for knitting machines. 3,664,155, Cl. 66-115.000
Dancy, Julian H.: *See—*
Flournoy, Norman E.; Morrison, John A.; Dancy, Julian H.; and Trippet, Raymond,3,664,804.
Danfoss A/S: *See—*
Knudsen, Jorgen Dahlman; Romer, Bendt Wegge; and Valbjorn, Knud Vagn, 3,664,769.
Leffers, Hans Ulrik; Romer, Bendt Wegge; and Valbjorn, Knud Vagan, 3,664,461.
Nielsen, Peter V., 3,664,193.
Pedersen, Kristian Stausholm, 3,664,886.
Stannow, Jorgen Christian, 3,664,581.
Danielson, Robert E., to Ball, Geo. J., Inc. Plant tray unit and shipping package. 3,664,062, Cl. 47-34.13
Danko, Donald M.; and Svarovsky, James E., to Gilmore Industries, Inc. Apparatus and method for controlling a resonant testing machine. 3,664,179, Cl. 73-67.2
Dann Bee Corporation: *See—*
Fournier, Daniel; and Strang, Urho A., 3,664,195.
Davidson, William E.: *See—*
Walker, Wendell C.; and Davidson, William E.,3,664,045.
Davies, Douglas R.: *See—*
Bidwell, Dennis P.; Davies, Douglas R.; Hanley, John T., Jr.; Hart, William K.; Henderson, Thomas A.; Lovell, Thomas W.; and Fogg, Lloyd C.,3,665,447.
Davies, Stuart Duncan; McCarthy, Roy Fred John; and Watts, Richard James, to Dowty Rotol Limited. Devices of fibrous-reinforced plastics material. 3,664,764, Cl. 416-224.
Davis & Furber Machine Company: *See—*
Netti, Anthony; and Bussiere, Douglas, 3,664,112.
Davis, Carlton J., Sr.: *See—*
Preston, Jerome A.; and Davis, Carlton J., Sr.,3,664,982.
Davis, Joseph W., III. Three-dimensional game board. 3,664,671, Cl. 273-131.
Davis, M. Paul; and Theobald, Paul R., to American Lava Corporation. Gold metallizing of refractory metals on ceramic substrates. 3,664,868, Cl. 117-212.000
Davis, Paul K., to Pacific Roller Die Co., Inc. Curving method and apparatus for ridged sheet material. 3,664,170, Cl. 72-307.
Davis, Ronald I.; and Scott, Kenneth A., to Sun Oil Company. Fractionation of C_{12} bicyclic aromatic hydrocarbons by di or trianhydride complex formation. 3,665,043, Cl. 260-674.00n
Davis, Ronald I.; and Scott, Kenneth A., to Sun Oil Company. Fractionation of eutectic mixtures of dimethylnaphthalenes by dianhydride complexation. 3,665,045, Cl. 260-674.00n
Davis, William F.; and Frederiksen, Thomas M., to Motorola, Inc. Audio frequency amplifier. 3,665,329, Cl. 330-19.000
Day, Albert J.: *See—*
Oberhart, George S., 3,665,161.
Dayco Corporation: *See—*
Huber, Walter E., 3,664,715.
Richmond, Kenneth D., 3,665,069.
DCA Food Industries, Inc.: *See—*
Schiffmann, Robert F.; Stein, Ernest W.; and Kaufman, Harold B., Jr., 3,665,141.
Deaton, Thomas Michael, to Otis Engineering Corporation. Well flow controlling systems, methods and apparatus. 3,664,427, Cl. 166-313.000
DeCoster, Lloyd D. Bias voltage supply. 3,665,334, Cl. 330-40.000

De Heus, Aart Arnoldus, to N.V. 'COQ'. Metal clad switch-gear for high voltage comprising cable terminal boxes. 3,665,257, Cl. 317-103.
De Hilster, Robert J.: *See—*
Blake, Richard K.; De Hilster, Robert J.; and Porter, Warren Wesley,3,665,113.
Delande S.A.: *See—*
Fauran, Claude P.; Raynaud, Guy M.; Pourrias, Bernard M.; and Douzon, Colette A., 3,665,014.
Del Giudice, William F.: *See—*
Schrade, Hans Christoph; Del Giudice, William F.; and Wimer, Charles W.,3,664,162.
Dell, Harold R.: *See—*
Becker, Carl H.; Dell, Harold R.; McFarland, Keith E.; and Wong, Herman,3,665,483.
DeLoach, Wells D. Irrigation towline assembly. 3,664,688, Cl. 285-6.
De Maio, Dennis A., to Halcon International, Inc. thylene oxide catalyst. 3,664,970, Cl. 252-454.
Dempsey, Richard C. Foldable antenna operable in dual modes. 3,665,478, Cl. 343-725.000
Dennison Manufacturing Company: *See—*
Cobb, Harold W., 3,665,181.
Denroche, Charles H. P.: *See—*
Sykes, Christopher; and Denroche, Charles H. P.,3,664,627.
Denss, Rolf; Clauson-Kaas, Niels; and Ostermayer, Franz, to Ciba-Geigy Corporation. Substituted phenylacetic acids and esters thereof. 3,665,010, Cl. 260-326.3
Denss, Rolf; Clauson-Kaas, Niels; and Ostermayer, Franz, to Ciba-Geigy Corporation. Substituted phenylacetic acids and esters thereof. 3,665,011, Cl. 260-326.3
Denton, Bryce A., to General Electric Company. Appliance cord-connecting structure. 3,665,374, Cl. 339-101.000
Denton, William E. Lightweight stretcher. 3,663,972, Cl. 5-82.
Deradorian, Bagdasar; Svenson, James; and Nalpka, Raymond, to Bendix Corporation, The. Electron multiplier with preamplifier. 3,665,497, Cl. 313-103.000
DeRadzitzky D'Ostrowick, Pierre; and Hanotier, Jacques D. V., to Labofina, Soc. An. Oxidation of alkyl aromatics. 3,665,030, Cl. 260-488.
Derby, Palmer P., to Raytheon Company. Novelty key chain. 3,664,039, Cl. 35-19.00a
DeRosset, Armand J., to Universal Oil Products Company. Separation of para-xylene from mixtures of C_8 aromatics utilizing crystalline aluminositicate adsorbents. 3,665,046, Cl. 260-674.
Desmarquest SA: *See—*
Meneret, Jean, 3,664,651.
Deutsch, Harold L. Fiber optic medical tool. 3,664,330, Cl. 128-18.
Deutsche Babcock & Wilcox Aktiengesellschaft: *See—*
Lachnit, Friedrich, 3,664,762.
Deutsche Edelstahlwerke Aktiengesellschaft: *See—*
Dietrich, Hermann; Schuler, Karl; and Meese, Heinz Gunter, 3,665,352.
Devellian, Richard D.: *See—*
Grout, Kenneth M.; and Devellian, Richard D.,3,664,638.
Devine, Arthur J. Apparatus for encapsulation under vacuum. 3,664,786, Cl. 425-99.
De Vito, Angelo R.; and Puzik, Otto V. Latch mechanism. 3,664,697, Cl. 292-173.000
Devro, Inc.: *See—*
Autry, Robert F., 3,664,849.
Miller, Albert T., 3,664,844.
Dexter Automatic Products Co., Inc.: *See—*
Tupper, Willis E.; and Hanson, John R., 3,664,774.
Dhno, Eiichi; and Akamatsu, Masahiko, to Mitsubishi Denki Kabushiki Kaisha. Direct current power control system. 3,665,286, Cl. 321-2.
Diamond Power Specialty Corporation: *See—*
Locke, James W., Sr.; and Goeller, John C., III, 3,664,310.
Dickinson, Clifford Lee, Jr., to Du Pont de Nemours, E. I., and Company. 1-Carbamoylpyrazole-4-sulfonamides. 3,665,009, Cl. 260-310.
Dietrich, Hermann; Schuler, Karl; and Meese, Heinz Gunter, to Deutsche Edelstahlwerke Aktiengesellschaft. Permanent magnet system for a loudspeaker. 3,665,352, Cl. 335-231.
Diginetics Incorporated: *See—*
Snook, Richard K., 3,665,115.
Dijkhuizen, Willem; and Beersma, Pieter Johannes Adrianus, to Scholten Research N.V. Carpets having a back-coating of in situ- formed polyurethane. 3,664,863, Cl. 117-161.0kp
Dilday, Kelly S., deceased (by Dilday, Stewart Anthony Dilday, Kelly Wayne, executors). Harvester. 3,664,526, Cl. 214-83.1
Dilday, Kelly Wayne: *See—*
Dilday, Kelly S.,3,664,526.
Dilday, Stewart Anthony: *See—*
Dilday, Kelly S.,3,664,526.
Dill, Dale R.: *See—*
Bergomi, Joseph G., Jr.; Dill, Dale R.; and Graham, Paul R.,3,665,060.
Di Napoli, Nicholas; Friedman, Donald; Nicholls, Robin P.; Wilcox, Howard A.; and Wood, Charles E., to Minicars, Inc. Automobile rental system. 3,665,397, Cl. 340-147.
Di Rosa, Gaetano, to SOC. F.A.T.A. S.p.A. Overhead dual-track conveyors systems. 3,664,267, Cl. 104-96.000
Disco Engineering, Inc.: *See—*
Henson, Artel R., 3,664,254.
Distler, Harry: *See—*
Widder, Rudi; Distler, Harry; and Haug, Erwin,3,664,864.
Ditz Crane: *See—*
Martin, Otis M.; Kough, John K.; Miller, Silas M.; and Kough, Blair B., 3,664,081.
Diversified Inventory Systems, Inc.: *See—*
Goodwin, Arthur J., 3,665,167.
Diwinsky, Gordon A.; and Kosky, Richard P., to Combustion Engineering, Inc. In-service inspection of reactor vessel welds. 3,664,922, Cl. 176-19.
Dock, Mortimer Russell, to H-2-O Filter Corporation, The. Packaging structure. 3,664,569, Cl. 229-10.
Dodds, Phyllis R.: *See—*
Chiola, Vincent; and Dodds, Phyllis R.,3,664,954.
Dodelino S.A.: *See—*
Trovati, Louis, 3,664,401.
Dolby Laboratories Inc.: *See—*
Dolby, Ray Milton, 3,665,345.
Dolby, Ray Milton, to Dolby Laboratories Inc. Compressors and expanders for noise reduction systems. 3,665,345, Cl. 333-14.
Dolgov, Anatoly Mikhailovich: *See—*
Tatianko, Nikolai Vasilievich; Tsymbal, Alexandr Gavrilovich; Stetsenko, Vladimir Vasilievich; Isikov, Sergei Alexandrovich; Rodenko, Fedor Leontievich; Betcher, Alexandr Samuilovich; Shamrai, Petr Dmitrievich; Dulya, Mikhail Afanasievich; Dudka, Viktor Vasilievich; Klimchuk, Ivan Petrovich; and Dolgov, Anatoly Mikhailovich,3,664,431.
Dollac Division, Jacoby-Bender, Inc.: *See—*
Leibowitz, William, 3,664,059.
Domain Industries, Inc.: *See—*
Early, Judson H., 3,664,222.
Domin, Siegfried: *See—*
Lewis, Martyn A.; and Domin, Siegfried,3,665,500.
Donaldson, Gordon W.; Graham, Charles D., Jr.; and Hart, Howard R., Jr., to General Electric Company. Superconductive magnets. 3,665,351, Cl. 335-216.
Donalies, Daniel J., to Xerox Corporation. Centrifugal development apparatus and method. 3,664,297, Cl. 118-627.
Donjon, Jacques, to Societe de Fabrication d'Instruments de Mesure (S.F.I.M.). Electrical signal sampling device. 3,665,496, Cl.
Donnell, Howard Kenneth: *See—*
Einthoven, Willem Gerard; and Donnell, Howard Kenneth,3,664,894.
Doran, Thomas J.; Wagner, Melvin P.; and Stevens, Henry C., to PPG Industries, Inc. Vulcanized rubber comprising a siliceous pigment, a rubber and an organic coupling agent having an active olefinic linkage. 3,664,403, Cl. 152-330.
Dosch, Thomas J., to Electronic Systems Division, a division of Dynamics Corporation of America. Anti-hijack system for vehicles. 3,665,386, Cl. 340-53.000
Dotter, Berton E., Jr.: *See—*
Lender, Adam; and Dotter, Berton E., Jr.,3,665,394.
Douglas, Ellwood S.; and Wahlgren, Wallace W., to Rucker Company, The. Differential transformer with balancing means. 3,665,356, Cl. 336-73.
Dounoucos, Angelo; and Harrison, John W., to General Electric Company. Aircraft closed circuit breathing system. 3,664,359, Cl. 137-81.000
Douzon, Colette A.: *See—*
Fauran, Claude P.; Raynaud, Guy M.; Pourrias, Bernard M.; and Douzon, Colette A.,3,665,014.
Dow Chemical Company, The: *See—*
Barstow, Ormand E., 3,664,194.
Dulmage, Fred C., 3,664,498.
Stehl, Rudolph H., 3,664,967.
Thomas, Edward J.; and Friedrich, Ralph E., 3,664,938.
Dow Corning Corporation: *See—*
Saam, John C.; and Fearon, Frederick W. G., 3,665,052.
Dowty Rotol Limited: *See—*
Chilman, John Alfred, 3,664,763.
Davies, Stuart Duncan; McCarthy, Roy Fred John; and Watts, Richard James, 3,664,764.
Dracon Industries: *See—*
Drake, King B., 3,664,514.
Dragerwerk Aktiengesellschaft: *See—*
Warnow, Detlef, 3,664,370.
Drake, King B., to Dracon Industries. Lock for hinged rack. 3,664,514, Cl. 211-169.
Draughon, Roland C.; Jensen, Paul D.; and Jensen, Donald F. Concrete plank molding machine. 3,664,792, Cl. 25-41.
Dreimanis, Herbert V.; Spisz, Albert S.; Merlino, Eugene L., Jr.; and Ellis, Jonas, to Burroughs Corporation. Document elevation apparatus for a strip printer. 3,664,481, Cl. 197-133.
Dresser Industries, Inc.: *See—*
Bullen, Ronald S., 3,664,422.
Dyer, Norman D., 3,664,184.
Fillion, Stanley H., 3,664,269.
Yehl, Frank A., 3,664,674.
Youmans, Arthur H., 3,665,195.
Drexelbrook Controls, Inc.: *See—*
Maltby, Frederick L., 3,665,301.
Driscoll, John J., to Allied Research Associates, Inc. Bullet trap. 3,664,263, Cl. 102-65.2
Drori, Moshe, to C.A.V. Limited. Liquid fuel injection pumping apparatus. 3,664,773, Cl. 417-507.

Drouhard, Alfred J., Jr.; and Stinson, Joseph B., to Mansfield Sanitary, Inc. Apparatus for pneumatic transportation of sanitary waste from a toilet to a holding tank. 3,663,970, Cl. 4-111.
Drozdowicz, Kenneth Paul; Fowler, William Rey; and Averkiou, George, to Motorola, Inc. Low saturation resistance, low offset voltage, monolithic analog switch. 3,665,266, Cl. 317-235.00r
Dubravec, Vladimir, to U.S. Philips Corporation. Permanent magnetic focusing device for multi- cavity klystrons. 3,665,242, Cl. 315-5.35
Duckwall, Paul, III: *See—*
Stichweh, James H.; Hornung, Stephen A.; and Duckwall, Paul, III,3,665,223.
DuCrest, Malquin S.; and DuCrest, Stephen W. Mop having coiled cleaning elements. 3,663,981, Cl. 15-225.
DuCrest, Stephen W.: *See—*
DuCrest, Malquin S.; and DuCrest, Stephen W.,3,663,981.
Duda, Vladimir Nikolaevich: *See—*
Shtin, Lev Mikhailovich; Grebnev, Nikolai Feodosovich; Satovskaya, Ljudmila Sergeevna; Rasseikin, Mikhail Grigorievich; Khirdzhiev, Sergei Grigorievich; Perevozchikov, Evgeny Titovich; Zagulina, Sofia Stepanovna; Duda, Vladimir Nikolaevich; and Karasev, Mikhail Andreevich,3,664,168.
Duddey, James E., to Goodyear Tire & Rubber Company, The. Cationic dyeable polyester modified with alkoxy benzene sulfonic acids. 3,664,984, Cl. 260-22.
Dudka, Viktor Vasilievich: *See—*
Tatianko, Nikolai Vasilievich; Tsymbal, Alexandr Gavrilovich; Stetsenko, Vladimir Vasilievich; Isikov, Sergei Alexandrovich; Rodenko, Fedor Leontievich; Betcher, Alexandr Samuilovich; Shamrai, Petr Dmitrievich; Dulya, Mikhail Afanasievich; Dudka, Viktor Vasilievich; Klimchuk, Ivan Petrovich; and Dolgov, Anatoly Mikhailovich,3,664,431.
Duff, Raymond A. Reinforced concrete boat hull and method of construction. 3,664,287, Cl. 114-65.
Duffy, Edward J. Portable height and depth setting gauge. 3,664,031, Cl. 33-185.
Duke, Keith A.: *See—*
Bouricius, Willard G.; Carter, William C.; Duke, Keith A.; Roth, John P.; and Schneider, Peter R.,3,665,174.
Duling, Irl N.; and Merges, John C., Jr., to Sun Oil Company. Extrusion of extremely high molecular weight polyolefins. 3,665,068, Cl. 264-211.
Dull, Ernst Hermann: *See—*
Brune, Werner; Schwartz, Gunter; Dull, Ernst Hermann; and Polly, Edgar,3,665,393.
Dulmage, Fred C., to Dow Chemical Company, The. Package including envelope with heat-shrunk band. 3,664,498, Cl. 206-65.
Dulya, Mikhail Afanasievich: *See—*
Tatianko, Nikolai Vasilievich; Tsymbal, Alexandr Gavrilovich; Stetsenko, Vladimir Vasilievich; Isikov, Sergei Alexandrovich; Rodenko, Fedor Leontievich; Betcher, Alexandr Samuilovich; Shamrai, Petr Dmitrievich; Dulya, Mikhail Afanasievich; Dudka, Viktor Vasilievich; Klimchuk, Ivan Petrovich; and Dolgov, Anatoly Mikhailovich,3,664,431.
Dumas, Henry J., Jr.: *See—*
Raye, George W.; Dumas, Henry J., Jr.; and Duncan, Lloyd N.,3,664,397.
Dumont-Fillon, Jacques; and Roederer, Charles, to Institut de Recherches de la Siderurgie Francaise. Electric arc furnace for continuously melting scrap iron. 3,665,085, Cl. 13-9.000
Duncan, David M. Deposited silicon diffusion sources. 3,664,896, Cl. 148-187.
Duncan, Lloyd N.: *See—*
Raye, George W.; Dumas, Henry J., Jr.; and Duncan, Lloyd N.,3,664,397.
Duncan, William A.: *See—*
Hubbuch, Theodore; Murfree, James A., Jr.; Duncan, William A.; Sandlin, Billy J.; and Nappier, Henry A.,3,664,969.
Dunkl, Franz S., to Sprague Electric Company. Electrolytic capacitor with improved electrolyte. 3,665,261, Cl. 317-230.
Dunlop Holding Limited: *See—*
Poyner, James, 3,664,405.
Dunlop Holdings Limited: *See—*
Tonkin, Stephen W., 3,664,266.
Dunn, Dixie. Eyebrow tweezers. 3,664,346, Cl. 128-355.
Dunn, Thomas J. Mounting assembly. 3,664,057, Cl. 56-10.4
Du Pont de Nemours and Company, E. I., and Company: *See—*
Loux, Harvey M., 3,664,823.
Du Pont de Nemours, E. I., and Company: *See—*
Dickinson, Clifford Lee, Jr., 3,665,009.
Hartig, Martval J., 3,664,906.
Ibach, William F.; Looney, Franklin S., Jr.; and Reitz, David C., 3,664,381.
MacDonald, Robert Neal, 3,664,986.
Dupree, Inc.: *See—*
Dupree, James N.; and Walker, Frank A., 3,665,459.
Dupree, James N.; and Walker, Frank A., to Dupree, Inc. Annunciator light hinged cover. 3,665,459, Cl. 340-381.000
Duran, Conrado E. Hand operated wheeled V-blade snowplow. 3,664,042, Cl. 37-47.
Dustikin Products, Inc.: *See—*
Scheuer, Fred F., 3,664,064.
Dutcher, Daniel P., to Hoerner Waldorf Corporation. Display carton. 3,664,493, Cl. 206-45.14
Dutton-Lainson Company: *See—*
Perry, Max W.; and Brockelsby, Norman D., 3,664,556.
Duvvuri, Tirumalesa, to Rohr Corporation. Twisted vane sound suppressor for aircraft jet engine. 3,664,455, Cl. 181-33.
Dvirka, Miro, to Hagan Industries, Incorporated. Drive system. 3,664,232, Cl. 91-36.
Dvoracnek, Karel: *See—*
Kochta, Zdenek; and Dvoracnek, Karel,3,664,157.
Dwyer, Raymond J. Article feeding mechanism. 3,664,547, Cl. 221-259.
Dyer, Norman D., to Dresser Industries, Inc. Rotary torque indicator for well drilling apparatus. 3,664,184, Cl. 73-136.00a
Dyke, Herbert Gordon. Clip. 3,663,994, Cl. 24-11.
Dymo Industries, Inc.: *See—*
Bremer, Georg Fritz, 3,664,477.
Dynamics Corporation of America: *See—*
Dosch, Thomas J., 3,665,386.
Voglesonger, Harry M., 3,665,373.
E-Z Serv, Inc.: *See—*
Schaffner, Myer J., 3,664,633.
Earl, William C.: *See—*
Palmer, Ansell W.; and Earl, William C.,3,665,119.
Early, Judson H., to Domain Industries, Inc. Labeling machine. 3,664,222, Cl. 83-205.000
Earnest, Elmer Dean: *See—*
Rehhausser, Frederick V.; Earnest, Elmer Dean; Bock, Robert V.; Gerbstadt, Frederick H.; and Monek, James J.,3,665,421.
Easterly, Donald O.; and Brown, Morris E., to Eastman Kodak Company. Reversible web transporting apparatus. 3,664,605, Cl. 242-189.000
Easterly, Donald O.; and Olcott, Raymond E., to Eastman Kodak Company. Cinematographic projector having a film supply spindle assembly. 3,664,608, Cl. 242-204.000
Eastman Kodak Company: *See—*
Ammons, Robert L.; and Moore, Robert B., Jr., 3,664,114.
Bresson, Richard J.; and Painton, Richard C., 3,664,245.
Easterly, Donald O.; and Brown, Morris E., 3,664,605.
Easterly, Donald O.; and Olcott, Raymond E., 3,664,608.
Jones, Evan Thomas, 3,664,839.
Jungjohann, Vernon H.; and Hagin, John D., 3,664,736.
Metzger, Lenard M., 3,664,735.
Miller, Howard A., 3,664,857.
Nerwin, Hubert, 3,664,595.
Painton, Richard C., 3,664,244.
Simon, Horst, 3,664,252.
Youngquist, Mary J., 3,664,835.
Ebauches S.A.: *See—*
Besson, Rene, 3,664,119.
Ebeling, Robert W., Jr.: *See—*
Vessel, Eugene D.; and Ebeling, Robert W., Jr.,3,664,132.
Eberly, David H., Jr., to United States Banknote Corporation. Process for producing collagen sponges. 3,665,061, Cl. 264-49.
Ebert, Paul J.: *See—*
Gaines, Jerry L.; Ebert, Paul J.; Mancebo, Lloyd; and Cook, Frederick D.,3,665,236.
Ebine, Kiyoshi: *See—*
Oya, Tsutom; and Ebine, Kiyoshi,3,665,435.
Ecodyne Corporation: *See—*
Wapner, Stanley H.; and Soriente, Alfonse J., 3,664,003.
Eden, Jamal S., to Goodrich, B. F., Company, The. Catalyst for preparing unsaturated acids and aldehydes. 3,664,968, Cl. 252-437.000
Edge, Andrew F.; and Hayase, Masashi, to McDonnell Douglas Corporation. Anti-arc induction heating tool. 3,665,138, Cl. 219-8.500
EG&G, Inc.: *See—*
Pinkham, Roger A., 3,665,100.
Pinkham, Roger A., 3,665,101.
Pinkham, Roger A., 3,665,104.
Shaler, David; and Varrichio, Ralph A., 3,664,299.
Ehara, Takashi: *See—*
Kambayashi, Akira; Shun-ichi, Kawasaki; and Ehara, Takashi,3,664,830.
Eibe, Helmut, to Roland Offsetmaschinenfabrik Faber & Schleicher AG. Device for fastening a pattern plate to a mold table or box. 3,664,408, Cl. 164-241.
Einthoven, Willem Gerard; and Donnell, Howard Kenneth, to RCA Corporation. Method of manufacturing semiconductor devices having high planar junction breakdown voltage. 3,664,894, Cl. 148-186.000
Eisenberg, Alfred: *See—*
Feher, Jozsef, 3,664,521.
Eisenmann, Wolfhart: *See—*
Fritze, Hartwig; Eisenmann, Wolfhart; and Preger, Max,3,664,033.
Elder, James T.; and Wright, Donald A., to Minnesota Mining and Manufacturing Company. Method and apparatus for detecting at a distance the status and identity of objects. 3,665,449, Cl. 340-280.
Electricite de France (Service National): *See—*
Guillot, Pierre; and Vuillot, Michel, 3,665,180.
Electronic Arrays, Inc.: *See—*
McCoy, Michael R.; and Walther, Terry R., 3,665,422.
Electronic Systems Division: *See—*
Dosch, Thomas J., 3,665,386.
Electronics Corporation of America: *See—*
Cade, Phillip J., 3,664,803.
Electronics Research, Inc.: *See—*
Silliman, Robert M., 3,665,479.

Electrospin Corporation: *See—*
Stalder, Herbert; and Pellaton, Jean, 3,664,110.
Elenburg, Wayland D. Formation clip sampling apparatus. 3,664,440, Cl. 175-206.
Elkins, James H., to United States of America, Navy. Underwater electrical connector. 3,665,509, Cl. 339-12.00v
Elks, Joseph; Phillipps, Gordon Hanley; and Tulley, Alan, to Glaxo Laboratories Limited. 9α-Unsubstituted-11β-chloro-19 nos-steroids. 3,665,021, Cl. 260-397.45
Eliard, James S., Jr., to United States of America, Navy. Latch and hinge device. 3,663,989, Cl. 16-147.000
Ellis, Clarence E. Integrated accessory group for pick-up trucks. 3,664,704, Cl. 296-24.
Ellis, John H., to Bendix Corporation, The. Electrical connector. 3,665,368, Cl. 339-60.00r
Ellis, Jonas: *See—*
Dreimanis, Herbert V.; Spisz, Albert S.; Merlino, Eugene L., Jr.; and Ellis, Jonas,3,664,481.
Elox, Inc.: *See—*
Sennowitz, Kurt H., 3,665,144.
Eltico Manufacturing Ltd.: *See—*
Johnsen, Erich Cornelius, 3,665,388.
Eltra Corporation: *See—*
Kerschbaum, Walter E., 3,664,510.
Ely Enterprises, Inc.: *See—*
Orendorff, Maxwell C.; and Mattern, Harvey L., 3,664,515.
Emcon Technology, Inc.: *See—*
Sweeney, Frank B., 3,664,368.
Emelyanenko, July Georgievich: *See—*
Paton, Boris Evgenievich; Lebedev, Vladimir Konstantinovich; Medovar, Boris Izrailevich; Pentegov, Igor Vladimirovich; Latash, Jury Vadimovich; Bondarenko, Oleg Petrovich; Baglai, Vitaly Mikhailovich; Podola, Nikolai Vasilievich; and Emelyanenko, July Georgievich,3,665,081.
Emerson Electric Co.: *See—*
Teske, Daniel E., 3,665,219.
Emerson Electric Company: *See—*
Caroleo, Steven J., 3,665,155.
Emerson, Paul Gene; Thamhain, Hans Jurgen; and McIntosh, Bruce Cromwell, to General Electric Company. Digital clock controlled by voltage level of clock reference signal. 3,664,116, Cl. 58-23.
Emery, Byron E., to Cutter Laboratories, Inc. Screw type closure cap. 3,664,536, Cl. 215-40.000
Emmons, Lawrence D., to Ampex Corporation. Maintaining a space between sheets from and onto which document images are transduced. 3,665,099, Cl. 178-6.70r
Enabnit, Robert S., to Goodyear Tire & Rubber Company, The. Signalling system for low tire condition on a vehicle. 3,665,387, Cl. 340-58.
Endo, Kunio, to Nippondenso Kabushiki Kaisha. Fuel injection control system for internal combustion engine. 3,664,311, Cl. 123-32.
Endo, Takaya: *See—*
Iwama, Masabuni; Inoue, Isaburo; Takei, Yutaka; and Endo, Takaya,3,664,841.
Energy Conversion Devices, Inc.: *See—*
Feinleib, Julius, 3,665,425.
Engel, Harold J. Resistance welding electrode. 3,665,145, Cl. 219-119.000
English Electric Company Limited, The: *See—*
Lorch, Hugh Olaf, 3,665,229.
Engman, Bert Hjalmar: *See—*
Udden, Per Edward Carl; Engman, Bert Hjalmar; and Graf, Siegfried,3,664,450.
Enslin, Nicholas Charl de Villiers. Polyphase alternating current frequency variator for induction and synchronous type motor. 3,665,273, Cl. 318-227.000
Ensmann, Burt W.: *See—*
Weiss, Gerhart; and Ensmann, Burt W.,3,664,673.
Environmental Technology, Incorporated: *See—*
Rich, Theodore A., 3,664,740.
Environment/One Corporation: *See—*
Stigberg, Carl E., 3,664,775.
Enzian, Ernest: *See—*
Weidlin von Boden, Alberto; and Enzian, Ernest,3,664,288.
Enzo, Ciatti. Device for fastening a hook to a fishing line. 3,664,005, Cl. 29-211.
Epstein, Joseph, to United States of America, National Aeronautics and Space Administration. Tungsten contacts on silicon substrates. 3,664,874, Cl. 136-89.000
ERC Electronic Research Corporation: *See—*
Hinrichs, Kurt; and Wilken, Gerd, 3,665,430.
Erdahl, Alan C.; and Evans, David C., to University of Utah. Electronically-generated perspective images. 3,665,408, Cl. 340-172.500
Erdco Engineering Corporation: *See—*
Archer, Lee A., 3,665,240.
Erdol-Raffinnerie Mannheim GmbH.: *See—*
Kreiss, Manfred, 3,664,357.
Erickson, John W.: *See—*
Salisbury, Robert E.; and Erickson, John W.,3,664,757.
Erico Products, Inc.: *See—*
Geiger, Willard L., 3,665,298.
Ernst, Wolfram: *See—*
Brandt, Fritz; and Ernst, Wolfram,3,665,510.
Escher Wyss GmbH: *See—*
Fritze, Hartwig; Eisenmann, Wolfhart; and Preger, Max, 3,664,033.
Esco Corporation: *See—*
Hahn, Frederick C., 3,664,044.
Escursell-Prat, Roberto. Method and means for yarn retrieval. 3,664,109, Cl. 57-34.
Eskay, Marion M., to Hubbel, Cohen & Stiefel. Means for converting magnetic tape cassette to audio- visual cassette. 3,664,603, Cl. 242-180.
Essig, Karl-August: *See—*
Kubitzek, Harry; Essig, Karl-August; Von Falkai, Bela; Reichle, Alfred; and Bodesheim, Ferdinand,3,664,914.
Esso Production Research Company: *See—*
Chenevert, Martin E., 3,664,426.
Graham, John W.; Kiel, Othar M.; Terry, William M.; and Sinclair, Albert R., 3,664,420.
Hibbard, Haines C., 3,665,466.
Mc Culloch, Thomas B., 3,664,437.
Penberthy, Walter L.; Bayless, Jack H.; and Ayers, Robert C., Jr., 3,664,425.
Penberthy, Walter L., Jr.; Bayless, Jack H.; and West, Robert C., 3,664,424.
Sasseen, John H., 3,664,610.
Esso Research and Engineering Company: *See—*
Panzer, Jerome, 3,664,955.
Valint, Paul L., Jr., 3,665,001.
Ester, Charles E., to Honeywell Information Systems Inc., mesne. Mounting device for printed wiring boards. 3,665,369, Cl. 339-75.
Etablissement Public: Agence Nationale de Valorisation de la Recherche 'Anvar':*See—*
Bonnet, Maurice; and Courtes, Georges, 3,664,741.
Etat Francais: *See—*
Martrier, Jean, 3,664,801.
Euclid, Inc.: *See—*
Chant, Leonard H., 3,664,706.
Euer, Hartmut; and Pauli, Gunter, to Vereinigte Flugtechnische Werke Fokker GmbH. Apparatus and method for measuring and analyzing dynamic processes. 3,665,505, Cl. 324-77.
European Atomic Energy Community (Euratom): *See—*
Lanza, Franco; and Marengo, Giuseppe, 3,664,865.
Evans, Benjiman E.: *See—*
Smith, James W., Sr.; Evans, Benjiman E.; Riggles, William M., Jr.; and Schormann, Urmas,3,664,456.
Evans, Carlton F.: *See—*
Baxter, Robert O.; Hollis, Clint R.; and Evans, Carlton F.,3,664,238.
Evans, Charles C.; and Sommer, Harry J., to Shell Oil Company. Paving asphalt compositions. 3,664,856, Cl. 106-278.
Evans, David C.: *See—*
Erdahl, Alan C.; and Evans, David C.,3,665,408.
Evans, Milton L., to General Electric Company. Imidatosilanes. 3,665,026, Cl. 260-448.8
Evans, Robert G.; and Stifel, George R. P., to Uniroyal Ltd., mesne. Polyurethane foam with integral skin. 3,664,976, Cl. 260-2.5
Every, Peter, to Kelsey-Hayes Company. Skid control valve assembly. 3,664,714, Cl. 303-21.
Ewen, Harold I.: *See—*
Haroules, George G.; Brown, Wilfred E., III; Ewen, Harold I.; Lilley, Arthur E.; and Kodis, Ralph D.,3,665,467.
Ewing, Joan R.: *See—*
Amidon, Alan B.; Sankus, Joseph G.; Petruzzella, Nicholas L.; and Ewing, Joan R.,3,664,834.
FA Otto Thamert, Textil-u. Kunstastoff GmbH & Co., KG: *See—*
Mohl, Wilhelm; and Kruger, Heinz, 3,663,968.
Fagan, Franklin G., Jr.: *See—*
Sussingham, George J.; and Fagan, Franklin G., Jr.,3,665,178.
Fairbanks Morse Inc.: *See—*
Henderson, Robert M.; Zechlin, Richard; and Miller, Lowell E., 3,665,169.
Fairbanks, Theodore H., to FMC Corporation. Apparatus for making scored film. 3,664,787, Cl. 18-12.
Fairbanks, Theodore H.; Gillespie, Robert F.; and Nelson, Dorsey C., to FMC Corporation. Apparatus for making oriented webs. 3,664,780, Cl. 425-66.
Fairchild Camera and Instrument Corporation: *See—*
Sahakian, Vahak K., 3,664,499.
Solomon, Raymond, 3,664,294.
Falconbridge Nickel Mines Limited: *See—*
Wigstol, Eivind, 3,664,815.
Fales, Douglas I., to General Motors Corporation. Vehicle condition responsive monitoring system having priority indication. 3,665,383, Cl. 340-52.
Farbenfabriken Bayer Aktiengesellschaft: *See—*
Buchel, Karl Heinz; Regel, Erik; Grewe, Ferdinand; Scheinpflug, Hans; and Kaspers, Helmut, 3,665,076.
Buchel, Karl-Heinz; Regel, Erik; Grewe, Ferdinand; Scheinpflug, Hans; and Kaspers, Helmut, 3,665,077.
Buchel, Karl-Heinz; Regel, Erik; Grewe, Ferdinald; Scheinpflug, Hans; and Kaspers, Helmut, 3,665,078.
Buchel, Karl-Heinz; Regel, Erik; Grewe, Ferdinand; Scheinpflug, Hans; and Kaspers, Helmut, 3,665,079.
Fuhr, Karl; Vernaleken, Hugo; Heine, Hans-Georg; Rudolph, Hans; and Schnell, Hermann, 3,664,937.

Kubitzek, Harry; Essig, Karl-August; Von Falkai, Bela; Reichle, Alfred; and Bodesheim, Ferdinand, 3,664,914.
Singer, Josef, 3,665,019.
Fasco Industries, Inc.: *See*—
Holstrom, Allan, 3,665,116.
Fassett, Matthew, to Raytheon Company. Annular slot antenna with stripline feed. 3,665,480, Cl. 343-754.
Fauber, Eugene M., to Atlantic Richfield Company. Coating removal method. 3,664,871, Cl. 134-6.
Fauran, Claude P.; Raynaud, Guy M.; Pourrias, Bernard M.; and Douzon, Colette A., to Delande S.A.2-Substituted 4-propargyloxymethyl-2-ethoxy- carbonyl-γ-butyrolactones. 3,665,014, Cl. 260-343.6
Faure, Jean-Marie. Transfer of a plurality of liquids. 3,664,364, Cl. 137-205.
Fearon, Frederick W. G.: *See*—
Saam, John C.; and Fearon, Frederick W. G.,3,665,052.
Federal-Mogul Corporation: *See*—
Haller, John, 3,664,008.
Fedorova, Valentine Vsevolodovna: *See*—
Menyailo, Anatoly Tikhonovich; Pospelov, Mikhail Valerievich; Kaliko, Olga Romanovna; Pokrovskaya, Inna Evgenievna; Fedorova, Valentine Vsevolodovna; Shilnikova, Albina Georgievna; Yakovleva, Antonina Karpovna; and Narozhenko, Tamara Georgievna,3,664,810.
Feenstra, Willem Hendrik; and Keppler, Johann Georg, to Lever Brothers Company. Compositions of mattter. 3,664,851, Cl. 99-163.
Feher, Jozsef, to Eisenberg, Alfred. Separator for nested articles. 3,664,521, Cl. 214-8.5
Fehler, Adolf, to Motoren- und Turbinen-Union Muenchen G.m.b.H. Gas turbine engine. 3,664,124, Cl. 60-39.28
Feiertag, Bruce A., to Fife Corporation. Web guiding device. 3,664,561, Cl. 226-21.
Feinleib, Julius, to Energy Conversion Devices, Inc. Information storage systems utilizing amorphous thin films. 3,665,425, Cl. 340-173.000
Felden, Alois, to Stahlgruber Otto Gruber & Co. Elastic sieve bottom. 3,664,503, Cl. 209-397.
Feldman, Osias, to Burroughs Corporation. Registering means providing simultaneous storage and transfer of separate amounts. 3,665,492, Cl. 235-60.
Feldman, Reuben J. Combination pliers and wrench tool. 3,664,214, Cl. 81-130.
Fenn, Raymond W., Jr.: *See*—
McCarthy, William H.; Fenn, Raymond W., Jr.; and Crooks, Donald D.,3,664,889.
Fenwick, Jay G., to Streater Industries, Inc. Hangrod assembly. 3,664,511, Cl. 211-105.100
Fenwick, Jay G., to Streater Industries, Inc., mesne. Sign mounting socket. 3,664,617, Cl. 248-38.000
Fernseh G.m.b.H.: *See*—
Legler, Ernst; and Kirchner, Karl, 3,665,220.
Ferplas Industries Limited: *See*—
Somann, Gert, 3,663,995.
Ferrari, Giuseppe, to S.p.A. Antonio Ferrari & Figli. Metering arrangement for polyurethane article producing machines. 3,664,551, Cl. 222-134.
Fetterolf, John S.: *See*—
Williams, James W., III; and Fetterolf, John S.,3,664,690.
Fibre Glass-Evercoat Co., Inc.: *See*—
Linder, Joseph, 3,664,508.
Fife Corporation: *See*—
Feiertag, Bruce A., 3,664,561.
Filipovici, Gheorghe. Apparatus for medical treatment by vibrations. 3,664,331, Cl. 128-51.
Filippi, Jean-Paul: *See*—
Zucca, Marc Edouard; and Filippi, Jean-Paul,3,664,123.
Fillion, Stanley H., to Dresser Industries, Inc. Combined body bolster center filler and center plate for railway cars. 3,664,269, Cl. 105-199.00c
Filztuchverwaltungs-Gesellschaft mit beschrankter Haftung: *See*—
Schuster, Wilhelm August, 3,664,905.
Fink, Alfred: *See*—
Haas, Herbert G.; Munk, Edmund; and Fink, Alfred,3,665,065.
Finn, Arthur F. Aquatic recreation device. 3,664,290, Cl. 115-20.
Finnegan, Walter D., to Kaiser Aluminum & Chemical Corporation. Steel-to-aluminum transition piece. 3,664,816, Cl. 29-196.200
Fioretti, Donald W. Nestable receptacle and container. 3,664,538, Cl. 220-4.
Fischer & Porter Company: *See*—
Hermanns, Henry, 3,664,191.
Fischer, Heinrich R., to Hurth, Carl, Maschinen-und Zahnradfabrik. Pressure-operated device for clamping of workpieces on gear processing machines. 3,664,227, Cl. 90-1.
Fischer, William H., to Westinghouse Electric Corporation. Circuit breakers having radial magnetic field coil inserted into series circuit during the opening operation. 3,665,134, Cl. 200-148.
Fish, Austin D.; Fisher, William G.; and Brubaker, Robert F., to General Motors Corporation. Method of supplying rinse water to a pair of open top tubs. 3,663,975, Cl. 8-158.
Fish Engineering & Construction, Inc.: *See*—
Hegwer, Arnold M., 3,664,091.
Fisher, William G.: *See*—
Fish, Austin D.; Fisher, William G.; and Brubaker, Robert F.,3,663,975.
Fisons Pharmaceuticals Limited: *See*—
Fitzmaurice, Colin; and Minshull, Robert, 3,665,013.
Fitzmaurice, Colin; and Minshull, Robert, to Fisons Pharmaceuticals Limited. Production of coumarin derivatives by a continuous method. 3,665,013, Cl. 260-343.2
Flechet, Jean: *See*—
Machon, Raymond; Flechet, Jean; and Hugo, Etienne,3,664,805.
Fleeton, David W.: *See*—
Wangard, William; and Fleeton, David W.,3,665,090.
Fleigher, Charles W., 60% to Gordon, Lloyd M. Pavement slicer. 3,664,707, Cl. 299-38.000
Fleming, James Evans; Lovell, Clarence A.; and Bandle, James M., to Air Land Systems Co. Radio communication system. 3,665,468, Cl. 343-102.000
Flight Dynamics Research Corporation: *See*—
Harris, Gordon L., 3,664,611.
Florian, Jaroslav; and Binovec, Ladislav, to Vyzkumny ustav pozemnich staveb. Collapsible belt conveyor. 3,664,488, Cl. 198-139.
Flournoy, Norman E.; Morrison, John A ; Dancy, Julian H.; and Trippet, Raymond, to Texaco Inc. Oil burner. 3,664,804, Cl. 431-183.
Flynn & Emrich Company: *See*—
Stanton, Stephen; and Varholy, Edward, 3,664,564.
Flynn, Adrian Francis, to General Electric Company Limited, The. Electric switching circuits. 3,665,292, Cl. 323-48.
FMC Corporation: *See*—
Fairbanks, Theodore H.; Gillespie, Robert F.; and Nelson, Dorsey C., 3,664,780.
Fairbanks, Theodore H., 3,664,787.
Hills, William A.; and Volpp, Gert P., 3,665,000.
Fogg, Lloyd C.: *See*—
Bidwell, Dennis P.; Davies, Douglas R.; Hanley, John T., Jr.; Hart, William K.; Henderson, Thomas A.; Lovell, Thomas W.; and Fogg, Lloyd C.,3,665,447.
Fontanelli, Renzo: *See*—
Sianesi, Dario; and Fontanelli, Renzo,3,665,041.
Fontijn, Leendert Antonius, to Nederlandse Centrale Organisatie voor Toegepast- Natuurwetenschappelijk Onderzoek. Screen combination. 3,664,843, Cl. 96-116.000
Foote, Allen M. Combination humidistat and heater. 3,664,579, Cl. 236-44.
Foote, Daniel J., to Master Lock Company, mesne. Protective anchoring assemblage. 3,664,163, Cl. 70-58.
Ford Motor Company: *See*—
Berry, James I., 3,664,711.
Rahnke, Christian J., 3,664,766.
Fornerod, Andre: *See*—
Sauterel, Gerard; and Fornerod, Andre,3,664,265.
Forney, George David, Jr., to Codex Corporation. Sequential decoding. 3,665,396, Cl. 340-146.1
Forsheda Gummifabrik Aktiebolag: *See*—
Malmstrom, Sven-Erik, 3,664,675.
Forslind, Paul A. Device for producing ionized air. 3,665,248, Cl. 317-4.
Forster, Peter: *See*—
Martini, Karl; Forster, Peter; Bierbaum, Dieter; and Halm, Gunther,3,664,472.
Foster, Alan, to International Computers Limited. Magnetic recording systems. 3,665,484, Cl. 346-74.
Foster, S. Harold; and Walker, Wendell C., to General Electric Company. Iron with overtemperature protection means. 3,665,152, Cl. 219-253.
Fournarakis, Solon: *See*—
Anthony, Peter C.; Colt, James G.; and Fournarakis, Solon,3,663,984.
Fournier, Daniel; and Strang, Urho A., to Dann Bee Corporation. Article testing apparatus. 3,664,195, Cl. 73-432.
Fowler, William Rey: *See*—
Drozdowicz, Kenneth Paul; Fowler, William Rey; and Averkiou, George,3,665,266.
Fradin, Jean; and Lengagne, Paul. Method of automatically packaging radio active sources and apparatus therefor. 3,664,083, Cl. 53-53.
Frank, Gerard A.; Kipp, Karl F.; and Oswald, Donald R., said Frank and said Kipp assors. to Western Electric Company, Incorporated, and said Oswald assor. to Bell Telephone Laboratories, Incorporated. Method for scrubbing thin, fragile slices of material. 3,664,872, Cl. 134-6.000
Frankel, Ernst G., to Seatrain Lines, Inc. Submersible tanker mooring system. 3,664,388, Cl. 141-284.
Franzmair, Rudolf: *See*—
Bretschneider, Hermann; Klotzer, Wilhelm; and Franzmair, Rudolf,3,665,012.
Frattallon, Michele. Heel with ornamental mask. 3,664,041, Cl. 36-42.
Fraze, Ermal C.: *See*—
Brown, Omar L.; and Fraze, Ermal C.,3,664,543.
Frazee, Orville Phillip, to Motorola, Inc. Fabrication of four-layer switch with controlled breakover voltage. 3,664,893, Cl. 148-175.000
Frazier, John R.: *See*—
Weeks, Horace W.; and Frazier, John R.,3,664,661.
Frederiksen, Thomas M.: *See*—
Davis, William F.; and Frederiksen, Thomas M.,3,665,329.
Fredriksson, Karl Garry Kenneth: *See*—
Mattsson, Leif Erling M.; and Fredriksson, Karl Garry Kenneth,3,664,390.

Freegard, Ernest M., to Advance Transformer Co. Universal bracket for mounting mercury ballasts. 3,664,624, Cl. 248-221.000

Freeman, Charles Robert: *See—*
Olyphant, Murray, Jr.; Cartier, Michael David; and Freeman, Charles Robert,3,665,428.

Freller, Helmut; and Obitz, Magdalena, to Siemens Aktiengesellschaft. Hall probe for measuring an axial magnetic field in a bore. 3,665,366, Cl. 338-32.

French, Thomas & Sons Limited: *See—*
Shaw, Walter, 3,663,979.

Frick Company: *See—*
Garland, Milton W.; and Schaeffer, Bruce S., 3,664,149.

Friedman, Donald: *See—*
Di Napoli, Nicholas; Friedman, Donald; Nicholls, Robin P.; Wilcox, Howard A.; and Wood, Charles E.,3,665,397.

Friedman, Herman H., to General Foods Corporation. Molecular fractionation by pulsed centrifugation. 3,664,845, Cl. 99-57.

Friedrich, Ralph E.: *See—*
Thomas, Edward J.; and Friedrich, Ralph E.,3,664,938.

Fritz, Albert J.; and Schwinn, Rudolph L., to Schwinn Bicycle Company. Bicycle frame-size indicator. 3,664,027, Cl. 33-174.

Fritz, Egon, to Reiners, Walter. Method of operating a warp knitting machine, especially a Raschel knitting machine, and device for carrying out the method. 3,664,154, Cl. 66-86.

Fritz, Paul C. Ribbon-type garage parking device. 3,664,291, Cl. 116-28.000

Fritze, Hartwig; Eisenmann, Wolfhart; and Preger, Max, to Escher Wyss GmbH. Method and apparatus for drying organic materials. 3,664,033, Cl. 34-12.000

Fraze, William R.; and Scarlett, Wallace W., to Plymouth Flush Door, Inc. Manufacture of bifold doors. 3,664,009, Cl. 29-429.

Froedge, Don T. Plastic extrusion device. 3,665,158, Cl. 219-421.

Frohlich, Alfons: *See—*
Heimberger, Helmut; and Frohlich, Alfons,3,663,996.

Fuchie, Tadayoshi, to Kabushikikaisha Yokogawa Denki Seisakusho (Yokogawa Electric Works, Ltd.). Pulse width modulation detector. 3,665,216, Cl. 307-234.

Fuhr, Karl; Vernaleken, Hugo; Heine, Hans-Georg; Rudolph, Hans; and Schnell, Hermann, to Farbenfabriken Bayer Aktiengesellschaft. Photosensitizing moulding and coating compositions with benzoin-silyl-esters. 3,664,937, Cl. 204-159.15

Fuji Photo Film Co., Ltd.: *See—*
Amano, Hiroyuki, 3,664,838.
Tajima, Mataichi, 3,665,186.

Fujii, Kinya: *See—*
Komatsu, Youji; Tamura, Takeshi; Fujii, Kinya; and Hatsutori, Masafumi,3,665,034.

Fujii, Masaru; Sagara, Kazuo; and Isomura, Shuichi, to Mitsubishi Jukogyo Kabushiki Kaisha. Speed controller for prime mover. 3,665,276, Cl. 318-318.

Fujikawa, Sukeyoshi; and Uemura, Yasuhiro, to Teac Corporation. Magnetic recording and reproducing apparatus. 3,664,672, Cl. 274-4.00d

Fujimoto, Syoji, to Nippon Electric Company, Limited. MOS integrated circuit semiconductor device. 3,665,265, Cl. 317-235.

Fujio, Ryota: *See—*
Onishi, Akira; Fujio, Ryota; and Kojima, Minoru,3,665,062.

Fujitsu Limited: *See—*
Kimura, Takashi; Kumagai, Kazuo; and Kanda, Kaoru, 3,665,432.
Sato, Tadakazu, 3,665,486.

Fukushima, Tsutomu: *See—*
Ando, Ryo; and Fukushima, Tsutomu,3,664,827.

Funada, Kiyotaka: *See—*
Kamiya, Nobuyuki; Funada, Kiyotaka; Shinohara, Takashi; and Imai, Hiroko,3,664,860.

Gaber, Martin. Reed switch construction. 3,665,136, Cl. 200-166.

Gabor, William D., to Sanders Associates, Inc. Elongated switch bar apparatus. 3,665,126, Cl. 200-5.00e

Gaines, George L., Jr.; and Le Grand, Donald G., to General Electric Company. Dielectric solution containing a polycarbonate-polydimethylsiloxane block copolymer additive. 3,664,959, Cl. 252-63.7

Gaines, Jerry L.; Ebert, Paul J.; Mancebo, Lloyd; and Cook, Frederick D., to United States of America, Atomic Energy Commission. Electrode structure for controlling electron flow with high transmission efficiency. 3,665,236, Cl. 313-55.

Gaines, Stanley L.: *See—*
Spergel, Philip; and Gaines, Stanley L.,3,664,178.

Gainesville Machine Company, Inc.: *See—*
Harben, Grover S., Jr., 3,663,991.

Gajewski, Wieslaw: *See—*
Bridgeman, Richard C.; and Gajewski, Wieslaw,3,664,177.

Gallagher, Frank William; and Casey, Richard C., to Bunker-Ramo Corporation, The. Automatic polling systems. 3,665,406, Cl. 340-172.5

Gallagher, William E. Removable eave gutter construction. 3,664,071, Cl. 52-15.000

Galli, Guido; and Coker, Jesse E., to North American Rockwell Corporation. Composite structure of zinc oxide deposited epitaxially on sapphire. 3,664,867, Cl. 117-201.000

Galvin, Aaron A., to Aerospace Research, Inc. Ultrasonic intrusion alarm. 3,665,443, Cl. 340-258.00a

Gam Rad, Inc.: *See—*
Shea, James J.; and Ochodnicky, Samuel S., 3,665,201.

Ganter, Wolfgang: *See—*
Assmus, Friedrich; and Ganter, Wolfgang,3,665,271.

Ganz Villamossagi Muvek: *See—*
Wallenstein, Mihaly, 3,665,230.

Garcea, Giampaolo, to Alfa Romeo S.p.A. Device for adjusting the idling in an internal combustion engine. 3,664,316, Cl. 123-124.

Gardner-Denver Company: *See—*
Council, Malcolm N., 3,664,439.

Gargini, Erich J., to Communications Patents Limited. Wired broadcasting systems. 3,665,311, Cl. 325-53.

Garland, Milton W.; and Schaeffer, Bruce S., to Frick Company. Controlled refrigeration application to a metallic conveyor belt. 3,664,149, Cl. 62-201.000

Garside Corporation: *See—*
Seaton, William Joe; and Pratt, Arnold T., 3,665,462.

Garwood, Eric P. On-site purification of problem petrolic liquid fuels. 3,664,802, Cl. 431-3.000

Gatwood, Robert K., to International Telephone and Telegraph Corporation. Short duration high current pulse generator. 3,665,222, Cl. 307-283.

Gauchet, Yves M., to Societe Anonyme Poclain. Earth-working machines. 3,664,528, Cl. 214-138.00r

Gausewitz, Carr & Rothenberg: *See—*
Kuechler, Irvin R., 3,664,255.

Gawler, Glenn B., to General Electric Company. Linear double balanced diode mixer. 3,665,508, Cl. 325-446.

Gay, Pierre, to Compagnie des Ateliers et Forges de la Loire. Method and device for the continuous rolling of thin strips. 3,664,166, Cl. 72-205.

Gebruder Junghans G.m.b.H., Firma: *See—*
Assmus, Friedrich; and Ganter, Wolfgang, 3,665,271.

Geiger, Willard L., to Erico Products, Inc. Metal impurity detector for tubular conveyor system. 3,665,298, Cl. 324-41.

Geigy Chemical Corporation: *See—*
Marshall, Alan; and Macpherson, Anne Wilson, 3,665,073.

Gelston, Brenda B. Disposable athletic supporter. 3,664,336, Cl. 128-158.

Genca, Samuel R.: *See—*
Tolliver, Peter M., 3,664,558.

General Dynamics Corporation: *See—*
Bowers, John O., Jr., 3,665,108.

General Electric Company: *See—*
Alter, Henry Ward; and Price, Paul B., 3,665,194.
Bakel, Joseph F.; and Rogers, George L., 3,665,170.
Becker, Joseph J., 3,664,892.
Bishop, James S., 3,665,234.
Born, Norman E.; Kolatorowicz, Edwin E.; and Plumb, Harry A., Jr., 3,665,274.
Canfield, Eugene Beach, 3,665,168.
Denton, Bryce A., 3,665,374.
Donaldson, Gordon W.; Graham, Charles D., Jr.; and Hart, Howard R., Jr., 3,665,351.
Dounoucos, Angelo; and Harrison, John W., 3,664,359.
Emerson, Paul Gene; Thamhain, Hans Jurgen; and McIntosh, Bruce Cromwell, 3,664,116.
Evans, Milton L., 3,665,026.
Foster, S. Harold; and Walker, Wendell C., 3,665,152.
Gaines, George L., Jr.; and Le Grand, Donald G., 3,664,959.
Gawler, Glenn B., 3,665,508.
Grubb, Willard T., 3,664,537.
Henry, Michael F., 3,664,883.
Keiles, Yoel; Kelley, Fred W., Jr.; and Lezan, Georges R. E., 3,665,293.
Kingsley, Jack D.; and Prener, Jerome S., 3,664,862.
Klint, Robert V., 3,665,350.
McIntosh, Bruce C., 3,664,117.
Mullersman, Ferdinand H.; and Rockey, Robert E., 3,665,285.
Peil, William, 3,665,507.
Sauer, Walter Edwin; and Klemas, Vytautas, 3,665,300.
Schaefer, Donald L.; and Wilson, Ronald H., 3,664,895.
Tomiyasu, Kiyo, 3,665,335.
Walker, Wendell C.; and Davidson, William E., 3,664,045.
White, Frederick M., 3,664,207.
Worcester, Joseph A., 3,665,319.
Wright, Archibald N.; and Merrill, Richard C., 3,664,899.
Wright, Archibald N.; and Merrill, Richard C., 3,665,269.
Wright, John H., 3,664,953.

General Electric Company Limited, The: *See—*
Flynn, Adrian Francis, 3,665,292.

General Fireproofing Company, The: *See—*
Johnson, Ronald C., 3,664,716.

General Foods Corporation: *See—*
Friedman, Herman H., 3,664,845.

General Mills, Inc.: *See—*
Vertnik, Leonard R., 3,664,980.

General Motors Corporation: *See—*
Fales, Douglas I., 3,665,383.
Fish, Austin D.; Fisher, William G.; and Brubaker, Robert F., 3,663,975.
Petersen, Victor, 3,664,676.
Winston, John M.; and Zimmerman, Walter H., 3,665,389.
Yasenchak, Richard W.; Schomer, Raymond A.; and Harper, Ernest V., 3,665,148.

General Signal Corporation: *See—*
Suchomel, Michael; Tipton, William; and Burnett, James H., 3,665,441.
General Wire Overseas Corporation: *See—*
Heilman, George P., 3,664,565.
Gentile, Tony: *See—*
Barnett, Elben Ray; and Barnett, Raymond Ray, 3,665,203.
Gerber, Bernard: *See—*
Golay, Jean-Pierre; and Gerber, Bernard,3,664,120.
Gerber Products Company: *See—*
Choate, Wallace W.; and Amendola, Norman A., 3,664,087.
Gerbstadt, Frederick H.: *See—*
Rehhausser, Frederick V.; Earnest, Elmer Dean; Bock, Robert V.; Gerbstadt, Frederick H.; and Monek, James J.,3,665,421.
Gerke, Peter; Rutkowski, Karl; Bock, Helmuth; and Palsa, Helmut, to Siemens Aktiengesellschaft. Switching arrangement for centrally controlled telephone exchange installation. 3,665,110, Cl. 179-18.
Germond, Jean-Claude; Guilbaud, Jean-Pierre; and Vertut, Jean, to Commissariat a l'Energie Atomique. Articulated master-slave manipulator. 3,664,517, Cl. 214-1.0cm
Gerstenberg, Dieter. Method for fabrication of thin film capacitor. 3,664,931, Cl. 204-38.00a
Giaimo, Edward Charles, Jr., to RCA Corporation. Manifold for fountain-type liquid dispenser. 3,664,298, Cl. 118-637.000
Gibney, Lloyd W., to American Optical Corporation. Rotary extrusion die. 3,664,789, Cl. 425-131.
Gibson, George W.: *See—*
Winget, Clifford L.; Gibson, George W.; and Shultz, William S.,3,664,438.
Gier, Delta W., to Baychem Corporation, mesne. Dialkenyl esters of aryloxyacetyl phosphonic acids as herbicides. 3,664,822, Cl. 71-86.000
Gierth, Volker: *See—*
Trieschmann, Hans-Georg; Pfannmueller, Helmut; Gropper, Hans; Gierth, Volker; and Beck, Gilbert,3,664,988.
Gilbey Equipment Ltd.: *See—*
Scott, Herbert W., 3,664,384.
Gillespie, Robert F.: *See—*
Fairbanks, Theodore H.; Gillespie, Robert F.; and Nelson, Dorsey C.,3,664,780.
Gillum, Daniel L.; and Gillum, Donald E., to Information Magnetics Corporation. Linear positioner for magnetic transducer. 3,665,433, Cl. 340-174.10f
Gillum, Donald E.: *See—*
Gillum, Daniel L.; and Gillum, Donald E.,3,665,433.
Gilmore Industries, Inc.: *See—*
Danko, Donald M.; and Svarovsky, James E., 3,664,179.
Gilson, Robert E.: *See—*
Gilson, Werren E.; and Gilson, Robert E.,3,664,593.
Gilson, Werren E.; and Gilson, Robert E. Gel fractionator. 3,664,593, Cl. 241-60.
Girling Limited: *See—*
Hiscox, Leonard R., 3,664,712.
Gislon, Andre; Weisang, Joseph-Edouard; and Maurin, Jean, to Compagnie Francaise de Raffinage. Method for the simultaneous preparation of a diolefin and an olefin. 3,665,047, Cl. 260-681.000
Gisser, Henry: *See—*
Messina, Joseph F.; and Gisser, Henry,3,664,956.
Messina, Joseph F.; and Gisser, Henry,3,664,958.
Giuffra, William E. Fuel injection system. 3,664,318, Cl. 123-139.
GKN. Birfield Transmissions Limited: *See—*
Macielinski, Jerzy Witold, 3,664,152.
G.K.N. Group Services Limited: *See—*
Carver, Bryan George; and Crooks, Ronald, 3,664,411.
Glass, John P.: *See—*
Hollander, Edward F., Jr., 3,664,813.
Glass, Marvin I.; Breslow, Jeffrey D.; and Jaworski, Eugene, to Marvin Glass & Associates. Doll launcher game. 3,664,670, Cl. 273-101.
Glatfelter, P. H., Company: *See—*
Olson, Robert A., 3,664,912.
Glatzer, Stephen G.; and Scappatura, Rocco. Signal transmitter. 3,665,315, Cl. 325-178.
Glaxo Laboratories Limited: *See—*
Elks, Joseph; Phillipps, Gordon Hanley; and Tulley, Alan, 3,665,021.
Kennedy, James; Long, Alan Gibson; and Underwood, William G. E., 3,665,003.
Glowzewski, Thomas L.; and Cutler, Hymie, to Bendix Corporation, The. Adaptive numberical control system for a machine tool. 3,665,493, Cl. 235-151.110
Glucoft, Harold; and Westerfield, James. Dial indicator holder. 3,664,029, Cl. 33-180.
Gnagi, Alex; and Muller, Peter, to Cerberus AG. Apparatus for monitoring the conductors or lines of fire alarm installations. 3,665,461, Cl. 340-409.000
Gobby, Alan B., to Gobby Mfg., Inc. Basket attachment for tricycle. 3,664,683, Cl. 280-202.000
Gobby Mfg., Inc.: *See—*
Gobby, Alan B., 3,664,683.
Godawski, Theodore J., to Zenith Radio Corporation. Television sweep transformer. 3,665,288, Cl. 321-24.000
Goeller, John C., III: *See—*
Locke, James W., Sr.; and Goeller, John C., III,3,664,310.
Goerth, Helmut; and Armbrust, Herbert, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Production of O-aminobenzonitriles. 3,665,029, Cl. 260-465.
Goff, Robert F., to Minnesota Mining and Manufacturing Company. Ion scattering spectrometer with neutralization. 3,665,185, Cl. 250-49.5
Goff, Robert F.; and Smith, David P., to Minnesota Mining and Manufacturing Company. Elemental analyzing apparatus. 3,665,182, Cl. 250-49.5
Golay, Jean-Pierre; and Gerber, Bernard, to Record Watch Co., S. A. Drive mechanism for an indicator of the date or the days of the week. 3,664,120, Cl. 58-58.000
Golay, Willis W. Hay covering. 3,664,070, Cl. 52-4.
Gold, Kenneth Stewart: *See—*
Pelta, Edmond R.; and Gold, Kenneth Stewart,3,665,294.
Golden Arrow Manufacturing Limited: *See—*
Palmer, Harry E., 3,664,770.
Golder, Jack Alexander: *See—*
Royle, Joseph Kenneth; Grant, John; and Golder, Jack Alexander,3,664,360.
Goldman, Paul: *See—*
Jarvis, Michael, 3,665,312.
Gonzalez, Cesar Fernandez-Veraud. Nuts and lock nuts coupled in one single unit for tightening at a controlled torsion. 3,664,226, Cl. 85-61.
Goode, John P.; Saeli, John J.; and Sformo, James P., to Sybron Corporation. Electrode retaining chuck handle assembly with adapter unit. 3,665,372, Cl. 339-91.
Goodrich, B. F., Company, The: *See—*
Eden, Jamal S., 3,664,968.
Goodwin, Arthur J., to Diversified Inventory Systems, Inc. Apparatus for monitoring dispension of liquid. 3,665,167, Cl. 235-92.0fl
Goodyear Aerospace Corporation: *See—*
Meilander, Willard C., 3,665,464.
Goodyear Tire & Rubber Company, The: *See—*
Duddey, James E., 3,664,984.
Enabnit, Robert S., 3,665,387.
Goransson, Nils Paul, to Saab-Scania Aktiebolag. Transducer for measuring mechanical forces. 3,664,187, Cl. 73-141.00a
Gordon, Harry W., to Schmid, Julius, Inc. Vaginal capsule. 3,664,341, Cl. 128-271.
Gordon, Jeffrey L., to Machlett Laboratories, Incorporated. Power regulating means for light amplifier tubes. 3,665,247, Cl. 315-205.000
Gordon, Lloyd M.: *See—*
Fleigher, Charles W., 3,664,707.
Gordon, Reuben H.; and Brown, Ivan H. Magnetic probe. 3,664,327, Cl. 128-1.4
Gordon, Ronnie D., to Continental Oil Company. Dehydrohalogenation catalyst. 3,664,966, Cl. 252-430.
Gore, W. L., & Associates, Inc.: *See—*
Gore, Wilbert L., 3,664,915.
Gore, Wilbert L., to Gore, W. L., & Associates, Inc. Sealing material. 3,664,915, Cl. 161-164.
Goto, Yuro. Article handling apparatus. 3,664,522, Cl. 214-8.5
Goudy, William E., to Armco Steel Corporation. Folding crane boom. 3,664,516, Cl. 212-46.
Goun, Nathan M.; and Wheatley, Carl F., Jr., to RCA Corporation. Heat dissipation for power integrated circuits. 3,665,256, Cl. 317-100.000
Grabner, Roy W.; Zimmerrman, Morris; Subjack, William J.; and Veber, Daniel F., to Merck & Co., Inc. Crystallization of L-asparaginase. 3,664,926, Cl. 195-66.00a
Grace, W. R., & Co.: *See—*
Pearl, David L.; Waller, John G.; and Head, Beverly P., Jr., 3,664,574.
Graefen, Hubert; and Kuron, Dieter, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Lead alloys having improved corrosion resistance. 3,664,831, Cl. 75-166.
Graf, Armin. Storage battery. 3,664,875, Cl. 136-134.
Graf, Siegfried: *See—*
Udden, Per Edward Carl; Engman, Bert Hjalmar; and Graf, Siegfried,3,664,450.
Graffeo, Joseph Victor, Jr.; Mason, Bertran W., Jr.; and Wells, Wallace Ogden, to Texas Instruments, Incorporated. Sputtering system. 3,664,948, Cl. 204-298.
Graham, Charles D., Jr.: *See—*
Donaldson, Gordon W.; Graham, Charles D., Jr.; and Hart, Howard R., Jr.,3,665,351.
Graham, John W.; Kiel, Othar M.; Terry, William M.; and Sinclair, Albert R., to Esso Production Research Company. Hydraulic fracturing using petroleum coke. 3,664,420, Cl. 166-280.000
Graham, Paul R.: *See—*
Bergomi, Joseph G., Jr.; Dill, Dale R.; and Graham, Paul R.,3,665,060.
Graham, Richard J.; Mottin, Ralph E.; and Noren, Oscar B., to Parke, Davis & Company. Locking capsule. 3,664,495, Cl. 206-63.2
Graifer, Valery Isaakovich; Komarov, Alexandr Ivanovich; Lysenko, Vladimir Dmitrievich; Mingareev, Ravkhat Shagimardanovich; and Mukharsky, Enver Davydovich. Method for the development of oil fields having zonally non-uniform collector properties. 3,664,418, Cl. 166-245.
Gram, Herbert R., to Transcience Inc. Radio signal initiated remote switching system. 3,665,475, Cl. 343-225.

Granco Equipment, Inc.: *See—*
Scanlon, Robert M.; and Beckwith, Hildreth C., 3,664,491.
Grane, Henry R.; and Katz, Isadore Edward, to Atlantic Richfield Company. Process to produce high purity isobutylene. 3,665,048, Cl. 260-682.
Grant, John: *See—*
Royle, Joseph Kenneth; Grant, John; and Golder, Jack Alexander,3,664,360.
Gray Manufacturing Company, Inc.: *See—*
Kincaid, Gary L., 3,664,635.
Gray Tool Company: *See—*
Holbert, Marvin L., Jr., 3,664,423.
Gray, William David; and Rauh, Charles Edward, to American Cyanamid Company. Thozalinone as an anti-Parkinson agent. 3,665,075, Cl. 424-272.000
Greatrix, Graham Roland: *See—*
Quayle, Joshua Creer; Greatrix, Graham Roland; and Coombe, Ronald Alan,3,664,306.
Grebnev, Nikolai Feodosovich: *See—*
Shtin, Lev Mikhailovich; Grebnev, Nikolai Feodosovich; Satovskaya, Ljudmila Sergeevna; Rasseikin, Mikhail Grigorievich; Khirdzhiev, Sergei Grigorievich; Perevozchikov, Evgeny Titovich; Zagulina, Sofia Stepanovna; Duda, Vladimir Nikolaevich; and Karasev, Mikhail Andreevich,3,664,168.
Greenberg, Allen A. Device for depositing dots of molding compound. 3,664,788, Cl. 18-30.
Greenspan, Lawrence E.; and Whitaker, Earl J., to Sanders Associates, Inc. Computer addressing apparatus. 3,665,402, Cl. 340-172.5
Gregory, Charles A., Jr.: *See—*
Carter, Robert; Amos, Ralph A.; and Gregory, Charles A., Jr.,3,665,495.
Greiner, James G.: *See—*
Stiefvater, Thomas L.; Greiner, James G.; Hale, John K.; and Waldrop, Thomas W.,3,664,105.
Grellier, Rene; and Guyot, Claude, to Societa Rhodiaceta. Polyamide-based composite filaments. 3,664,916, Cl. 161-173.
Grellier, Rene; and Guyot, Claude, to Societe Rhodiaceda. Two-component polyamide yarns. 3,664,917, Cl. 161-173.
Gretsky, Anthony J., to Brunswick Corporation. Lane resurfacer with cutter position control eccentrics. 3,664,392, Cl. 147-117.
Gretzky, Anthony J.: *See—*
McLeod, David P. J.; and Gretzky, Anthony J.,3,664,393.
Grewe, Ferdinald: *See—*
Buchel, Karl-Heinz; Regel, Erik; Grewe, Ferdinald; Scheinpflug, Hans; and Kaspers, Helmut,3,665,078.
Grewe, Ferdinand: *See—*
Buchel, Karl Heinz; Regel, Erik; Grewe, Ferdinand; Scheinpflug, Hans; and Kaspers, Helmut,3,665,076.
Buchel, Karl-Heinz; Regel, Erik; Grewe, Ferdinand; Scheinpflug, Hans; and Kaspers, Helmut,3,665,077.
Buchel, Karl-Heinz; Regel, Erik; Grewe, Ferdinand; Scheinpflug, Hans; and Kaspers, Helmut,3,665,079.
Grey, Donald M., to Sperry Rand Corporation. Method and apparatus for forming a tie pattern of bales on a bale wagon. 3,664,519, Cl. 214-6.00b
Greyson, Jerome; and Rogers, Howard H., to United States of America, Interior, mesne. Suspension dewatering method. 3,664,940, Cl. 204-180.00r
Grill, Raymond J., to TRW Inc. Fluids flow system with self-flushing revolving filter. 3,664,509, Cl. 210-391.
Gropper, Hans: *See—*
Trieschmann, Hans-Georg; Pfannmueller, Helmut; Gropper, Hans; Gierth, Volker; and Beck, Gilbert,3,664,988.
Gross, Harry, to Canadian Patents and Development Limited. Susceptibility meter for field use for determining susceptibility of a rock cutcrop. 3,665,296, Cl. 324-34.
Gross, Robert D.; and Rogers, Roland T., to Singer Company, The, mesne. Alterable read only memory organization. 3,665,426, Cl. 340-173.0sp
Groteke, Daniel Edward, to American Standard Inc. Die casting densifier and ejector apparatus. 3,664,410, Cl. 164-303.
Grout, Kenneth M.; and Devellian, Richard D., to Kenics Corporation. Mixing device. 3,664,638, Cl. 259-4.000
Grove, Marvin H.; and Van Arsdale, Lyle R., to M&J Valve Company. Pumping station sphere handling method and system. 3,664,356, Cl. 137-1.
Grover, Ben L.: *See—*
Campbell, Curtis B.; and Grover, Ben L.,3,664,192.
Grubb, Willard T., to General Electric Company. Seal and closure for ion-selective electrode. 3,664,537, Cl. 220-2.1
GTE Automatic Electric Laboratories, Incorporated: *See—*
Lender, Adam; and Dotter, Berton E., Jr., 3,665,394.
GTE Sylvania Incorporated: *See—*
Ng, David M.; and Rehkopf, Charles H., 3,664,295.
Shaffer, John W.; and McDonough, Thomas B., 3,665,176.
Stefani, Richard D., 3,665,253.
Guertin, Robert W.; and Murray, Robert L. Valve seal for coupling device. 3,664,634, Cl. 251-333.
Guilbaud, Jean-Pierre: *See—*
Germond, Jean-Claude; Guilbaud, Jean-Pierre; and Vertut, Jean,3,664,517.
Guillot, Pierre; and Vuillot, Michel, to Electricite de France (Service National). Method and apparatus for measuring the water content of a snow pack. 3,665,180, Cl. 250-43.5
Gullick Dobson Limited, Inc.: *See—*
Cooper, Kenneth, 3,664,138.
Gustafson, August W.; and Gustafson, Edna L. Propulsion means for ball retrieving apparatus. 3,664,532, Cl. 214-356.000
Gustafson, Edna L.: *See—*
Gustafson, August W.; and Gustafson, Edna L.,3,664,532.
Gutmann, Johanes, to Sen Electronique. Method and apparatus for testing the individual emissive properties of a plurality of radioactive specimens. 3,665,188, Cl. 250-83.3
Guyot, Claude: *See—*
Grellier, Rene; and Guyot, Claude,3,664,916.
Grellier, Rene; and Guyot, Claude,3,664,917.
Guyton, David. Cylindrical lens systems for simultaneous bimeridional measurement in a lens measuring instrument. 3,664,631, Cl. 351-27.
H-2-O Filter Corporation, The: *See—*
Dock, Mortimer Russell, 3,664,569.
Haas, Herbert G.; Munk, Edmund; and Fink, Alfred. Method for molding articles of uneven thickness. 3,665,065, Cl. 264-113.000
Haas, Karl Heinz, to Leitz, Ernst, GmbH. Accessory for microscopes for use as a two-beam photometer. 3,664,751, Cl. 356-219.000
Haberhauer, Hertha: *See—*
Haberhauer, Karl; and Haberhauer, Hertha,3,664,380.
Haberhauer, Karl; and Haberhauer, Hertha, to Weinheimer Gummiwarenfabrik Weisbrod & Seifert GmbH. Loom with traveling shed. 3,664,380, Cl. 139-12.
Hacias, Kenneth J., to Hooker Chemical Corporation. Electroless copper plating solution and process. 3,664,852, Cl. 106-1.
Hack, Albert G. W.: *See—*
Valle, Thomas, 3,664,006.
Hagan Industries, Incorporated: *See—*
Dvirka, Miro, 3,664,232.
Hagel, Carl Heinrich. Vehicle parking apparatus with an annular elevator platform. 3,664,523, Cl. 214-16.1
Hagin, John D.: *See—*
Jungjohann, Vernon H.; and Hagin, John D.,3,664,736.
Hahn, Frederick C., to Esco Corporation. Releasable lock arrangement for excavating teeth and the like. 3,664,044, Cl. 37-142.
Halcon International, Inc.: *See—*
De Maio, Dennis A., 3,664,970.
Russell, Joseph L., 3,665,028.
Hale, John K.: *See—*
Stiefvater, Thomas L.; Greiner, James G.; Hale, John K.; and Waldrop, Thomas W.,3,664,105.
Hall, Stanley Rylon; and Nichols, Thomas Gilbert, to Bunker-Ramo Corporation, The. Method and apparatus for detecting the frequency of a repetitive pulse signal. 3,665,512, Cl. 343-18.00e
Haller, John, to Federal-Mogul Corporation. Method of producing elongated highly densified powdered metal articles. 3,664,008, Cl. 29-420.
Halliburton Company: *See—*
Wray, Gary Q.; and Petty, George E., 3,664,415.
Halm, Gunther: *See—*
Martini, Karl; Forster, Peter; Bierbaum, Dieter; and Halm, Gunther,3,664,472.
Hamilton Company: *See—*
Reid, John D., 3,664,374.
Hamilton Watch Company: *See—*
Walton, Richard S., 3,664,118.
Hammell, Kemper Martel; and Kaylor, Karl Lester, to AMP Incorporated. Spring receptacle contact and housing therefor. 3,665,378, Cl. 339-217.
Hammerla A.G.: *See—*
Hanni, Eduard, 3,664,174.
Hammes, Wilhelm. Container construction. 3,664,544, Cl. 220-60.
Hammond, Arthur W.; and Miller, Marie E. Combination spoon and toothpick. 3,664,020, Cl. 30-142.000
Hammond Machinery Builders, Inc.: *See—*
Bass, Miles M., 3,664,947.
Hance, Richard James, to Leeds & Northrup Company. Immersion temperature responsive device. 3,664,882, Cl. 136-234.
Hand, Albert Michael, to Steadman Industries (Nassau) Limited, mesne. Freight container transfer system. 3,664,533, Cl. 214-516.
Hanes, James W. E., to Vetco Offshore Industries, Inc. Selectively lockable casing hanger. 3,664,689, Cl. 285-18.
Haney, Thomas A.; and Bruno, Gerald A., to Squibb, E. R., & Sons, Inc. Eluent for radioisotopes. 3,664,964, Cl. 252-364.
Hanley, John T., Jr.: *See—*
Bidwell, Dennis P.; Davies, Douglas R.; Hanley, John T., Jr.; Hart, William K.; Henderson, Thomas A.; Lovell, Thomas W.; and Fogg, Lloyd C.,3,665,447.
Hanni, Eduard, to Hammerla A.G. Sheet metal working machine. 3,664,174, Cl. 72-441.
Hanotier, Jacques D. V.: *See—*
DeRadzitzky D'Ostrowick, Pierre; and Hanotier, Jacques D. V.,3,665,030.
Hanover Guest Quality Foods Corporation: *See—*
Meckley, George E., 3,664,084.
Hansel, Otto, GmbH: *See—*
Revas, Leon, 3,664,483.
Hansen, Gerhard. Mandrel for a device for the production and filling of a container of thermoplastic synthetic material. 3,664,793, Cl. 18-5.
Hansen Manufacturing Company, The: *See—*
Marette, Ralph Thomas, 3,664,375.

Hanson, James R.: *See—*
Ayers, Ray R.; Titus, Paul E.; and Hanson, James R.,3,664,504.

Hanson, John R.: *See—*
Tupper, Willis E.; and Hanson, John R.,3,664,774.

Hanson, Walter J., to Pitney-Bowes, Inc. Locking device. 3,664,231, Cl. 70-292.000

Harada, Kazuto, to Kuraray Co., Ltd. Method of producing a moisture permeable sheet material. 3,665,157, Cl. 219-384.

Harben, Grover S., Jr., to Gainesville Machine Company, Inc. Method and apparatus for eviscerating chickens or other fowl. 3,663,991, Cl. 17-11.

Harby, Bernard, Limited: *See—*
Harby, Bernard M., 3,663,986.

Harby, Bernard M., to Harby, Bernard, Limited. Carpet edge moulding. 3,663,986, Cl. 16-7.000

Hardebeck, Klaus: *See—*
Popelak, Alfred; Lerch, Ansgar; Stach, Kurt; Roesch, Egon; and Hardebeck, Klaus,3,665,002.

Hardinge Brothers, Inc.: *See—*
Catlin, Francis D., 3,663,999.

Harlan, Kenneth C.: *See—*
Harvill, J D.; and Harlan, Kenneth C.,3,664,165.

Harmjanz, Dietrich. Electric heart stimulation method and electrode. 3,664,347, Cl. 128-404.

Haroules, George G.; Brown, Wilfred E., III; Ewen, Harold I.; Lilley, Arthur E.; and Kodis, Ralph D., to United States of America, National Aeronautics and Space Administration. Clear air turbulence detector. 3,665,467, Cl. 343-100.0me

Harper, Ernest V.: *See—*
Yasenchak, Richard W.; Schomer, Raymond A.; and Harper, Ernest V.,3,665,148.

Harper-Wyman Company: *See—*
Michaels, Leonard H., 3,664,323.
Stohrer, Charles E., Jr.; and Smith, Bissell J., 3,664,591.

Harrington, Thomas L.; and Jorgensen, Jens L., to Minnesota Mining and Manufacturing Company. Method for marking roadways. 3,664,242, Cl. 94-22.000

Harris, Charles R., Sr. Sprinkler head. 3,664,586, Cl. 239-233.

Harris, Gordon L., to Flight Dynamics Research Corporation. Aerodynamic vehicle. 3,664,611, Cl. 244-42.

Harris, Nicholas D., to Morton-Norwich Products, Inc. Process for preparing 4-hydroxy-6,7- substituted-3-carboalkoxyquinolines. 3,665,005, Cl. 260-287.

Harris, Robert B.; and MacDonald, John A., to Synergetics Research, Inc. Variable frequency infra red source. 3,665,338, Cl. 331-94.5

Harrison, John W.: *See—*
Dounoucos, Angelo; and Harrison, John W.,3,664,359.

Hart, H. W., Mfg. Co.: *See—*
Hart, Harold W.; and Hart, Warren H., 3,664,305.

Hart, Harold W.; and Hart, Warren H., to Hart, H. W., Mfg. Co. Extendible watering system for fowls. 3,664,305, Cl. 119-72.

Hart, Howard R., Jr.: *See—*
Donaldson, Gordon W.; Graham, Charles D., Jr.; and Hart, Howard R., Jr.,3,665,351.

Hart Schaffner & Marx: *See—*
Novak, Michael J., 3,663,964.

Hart, Warren H.: *See—*
Hart, Harold W.; and Hart, Warren H.,3,664,305.

Hart, William K.: *See—*
Bidwell, Dennis P.; Davies, Douglas R.; Hanley, John T., Jr.; Hart, William K.; Henderson, Thomas A.; Lovell, Thomas W.; and Fogg, Lloyd C.,3,665,447.

Hartig, Martval J., to Du Pont de Nemours, E. I., and Company. Structural panel of ribbed structures of thermoplastic resin. 3,664,906, Cl. 161-68.

Hartman, Clinton W., to CTS Corporation. Multi-impedance electrical component. 3,665,365, Cl. 338-190.

Hartmann, Frederick; and Huffmann, Billy J., to North American Rockwell Corporation. Apparatus for determining shape. 3,665,419, Cl. 340-172.5

Hartmann, Karl lilhelm, to AMP Incorporated. Zero-insertion force connector. 3,665,370, Cl. 339-75.0mp

Hartwell Corporation: *See—*
Poe, Lloyd Richard, 3,664,696.

Harvill, J D.; and Harlan, Kenneth C., to Wallace-Murray Corporation. Method and die construction for fan blade. 3,664,165, Cl. 72-168.

Hascher, Klaus: *See—*
Strelow, Alfred; and Hascher, Klaus,3,664,108.

Hasz, John R., to Cincinnati Milacron Inc. Damping means for increasing the minimum dynamic stiffness of a shaft. 3,664,228, Cl. 90-11.

Hathaway, Richard A., to Cartridge Television, Inc., mesne. Cartridge and tape stretch placement system for video reproducer and/or recorder. 3,665,114, Cl. 179-100.2

Hatley, Elbert Troy: *See—*
Benson, Allen B.; and Hatley, Elbert Troy,3,665,513.

Hatsutori, Masafumi: *See—*
Komatsu, Youji; Tamura, Takeshi; Fujii, Kinya; and Hatsutori, Masafumi,3,665,034.

Hatton, John A., Jr.; and McNally, John S. Polymerizable unsaturated polyester resin compositions and articles made therefrom. 3,665,055, Cl. 260-862.

Haube, Stephen G.: *See—*
Magee, Edward F.; and Haube, Stephen G.,3,665,086.

Haucke, Paul A.; Rosenfeld, Seymour; Schwab, Ronald W.; and Mazzeo, Charles F., to Buchanan Electrical Products Corporation. Hopper feed crimping machine with combination container-hopper. 3,664,173, Cl. 72-424.

Haug, Erwin: *See—*
Widder, Rudi; Distler, Harry; and Haug, Erwin,3,664,864.

Haugwitz, Rudiger D.; and Narayanan, Venkatachala Lakshmi, to Squibb, E. R., & Sons, Inc.Thiazolo[3,4-a]benzimidazoles and derivatives thereof. 3,665,007, Cl. 260-306.700

Haumiller, Clifford A. Orienting workpieces. 3,664,484, Cl. 198-33.

Hauni-Werke Korber & Co., KG.: *See—*
Schubert, Bernhard; Schubert, Alfred; and Berlin, Herbert, 3,664,891.

Havas, Janos; and Lechaton, John S., to International Business Machines Corporation. End point detection method and apparatus for sputter etching. 3,664,942, Cl. 204-192.

Haverkamp, Klaus Dieter: *See—*
Kraemer, Friedrich; Mandel, Jorn; Mayer, Siegfried; Rohrig, Klaus; Schulz, Hans-Peter; Weidenmuller, Hilmar; Haverkamp, Klaus Dieter; and Motz, Jurgen,3,664,826.

Hawkins, John C., to Rubery, Owen & Co. Limited. Hinge for doors of freight containers, transport vehicles and the like. 3,663,987, Cl. 16-128.

Hawley, George F.; and Buettner, John H., to Ivanhoe Research Corporation, mesne. Methods and apparatus for automatically transferring and registering fabric workpieces and for combining them. 3,664,657, Cl. 270-58.

Hawthorne, Nathaniel F.: *See—*
Norman, Melvin H.; and Hawthorne, Nathaniel F.,3,664,597.

Hayase, Masashi: *See—*
Edge, Andrew F.; and Hayase, Masashi,3,665,138.

Hayden, David M. Utility caddy for roller painting. 3,663,982, Cl. 15-257.000

Haydon, Arthur W.; and Crossley, Harry E., to Tri-Tech, Inc., mesne. Time delay relay. 3,665,348, Cl. 335-68.

Haynes, Harold L.: *See—*
Morrison, Albert R.; and Haynes, Harold L.,3,664,855.

Hayssen Manufacturing Company: *See—*
James, Robert C.; Wilson, David A.; and Pringle, Frank E., Jr., 3,664,086.

Hazlewood, John F.; and Ruehl, Herbert T., to Kelley Company, Inc. Protective bumper. 3,664,075, Cl. 52-173.000

Head, Beverly P., Jr.: *See—*
Pearl, David L.; Waller, John G.; and Head, Beverly P., Jr.,3,664,574.

Heald Machine Company, The: *See—*
Uhtenwoldt, Herbert R., 3,664,718.

Heffner, William J.: *See—*
Campbell, Donald J.; Heffner, William J.; Jennings, Paul H.; and King, Jane E.,3,665,487.

Hegwer, Arnold M., to Fish Engineering & Construction, Inc. Process and system for removing acid gas from natural gas. 3,664,091, Cl. 55-29.

Hehl, Karl. Attachment for injection-molding machines. 3,664,212, Cl. 81-52.5

Heidrich, Klaus; Krewitt, Alfred; Loos, Kurt; and Pithan, Fritz, to Kabelschlepp Gesellschaft mit beschrankter Haftung. Chain for supporting energy conveying means, and chain link therefor. 3,664,619, Cl. 248-51.

Heilman, George P., to General Wire Overseas Corporation. Automatic feed mechanism for nailing guns. 3,664,565, Cl. 227-137.

Heiman, Udo G., to Proll Products Co. Mechanically balanced keyboard and reed chamber assembly for musical instruments. 3,665,092, Cl. 84-351.000

Heimberger, Helmut; and Frohlich, Alfons, to Opti-Holding AG. Tape-supported separable slide fastener. 3,663,996, Cl. 26-205.11

Heimbigner, Gary Lee, to North American Rockwell Corporation. Address decode logic for a semiconductor memory. 3,665,473, Cl. 340-166.0fe

Heimlich, Henry J. Retractable aspirator tubing and sheath for surgical use. 3,664,342, Cl. 128-276.000

Heine, Hans-Georg: *See—*
Fuhr, Karl; Vernaleken, Hugo; Heine, Hans-Georg; Rudolph, Hans; and Schnell, Hermann,3,664,937.

Heinz, Schippers; and Hensen, Friedhelm, to Barmag Barmer Maschinenfabrik Aktiengesellschaft. Screw extruders with dual section ejection zone. 3,664,795, Cl. 425-208.

Held, Franklin W. Racketball or tennis racket having a tubular metal frame. 3,664,668, Cl. 273-73.

Heller, Walter E., & Company: *See—*
Wangard, William; and Fleeton, David W., 3,665,090.

Helm, Herbert W., to Smithe, F. L., Machine Company, Inc. Arrangement for adjustable split scoring of seal and bottom score of an envelope of a bag blank. 3,664,240, Cl. 93-58.1

Helmers, Helmut; Werner, Georg; and Rix, Albert, to Olympia Werke AG. Apparatus for braking a tabulating carriage movement. 3,664,480, Cl. 197-64.000

Hemmer, William R., to Collins Radio Company. Mistuned VOR receiver alarm. 3,665,470, Cl. 343-106.00r

Hendershot, James R., Jr.; and Searle, Robert F., to Vibrac Corporation. Combination magnetic particle clutch and brake assembly. 3,664,473, Cl. 192-21.5

Henderson, Robert M.; Zechlin, Richard; and Miller, Lowell E., to Fairbanks Morse Inc. Electronic measuring unit. 3,665,169, Cl. 235-151.300

Henderson, Thomas A.: *See—*
Bidwell, Dennis P.; Davies, Douglas R.; Hanley, John T., Jr.; Hart, William K.; Henderson, Thomas A.; Lovell, Thomas W.; and Fogg, Lloyd C.,3,665,447.

Henrich, Werner. Wire drawing apparatus. 3,664,169, Cl. 72-278.

Henriksen, Elmer C.: *See—*
Burm, George C.; Henriksen, Elmer C.; and Mateja, Eugene V.,3,665,446.

Henry, Michael F., to General Electric Company. Pre-passivation-anodic inhibitor-color method for detecting cracks in metal bodies. 3,664,883, Cl. 148-6.200

Hensen, Friedhelm: *See—*
Heinz, Schippers; and Hensen, Friedhelm,3,664,795.

Henson, Artel R., to Disco Engineering, Inc. Modular roof system. 3,664,254, Cl. 98-36.

Henson, William P., to Mobile Drilling Company, Inc. Air drilling method using controlled split stream. 3,664,444, Cl. 175-323.

Herberlein Patent Corporation: *See—*
Orth, Peter, 3,665,306.

Herbsthofer, Franz Joseph, to Massey-Ferguson G.m.b.H. Rotating grain tank unloader. 3,664,525, Cl. 214-17.00d

Hercules Incorporated: *See—*
Mahlman, Bert H., 3,664,981.
Mahlman, Bert H., 3,665,059.

Hercules Packing Corporation: *See—*
Horvath, Guy E., 3,664,908.

Hermanns, Henry, to Fischer & Porter Company. Explosion-proof self-cleaning electrodes. 3,664,191, Cl. 73-194.

Hermieu, Max R. L., to Machines Automatiques Modernes. Photoelectric measuring devices. 3,664,752, Cl. 356-206.

Hester, James F. Material handling apparatus, method and article formed therefrom. 3,664,284, Cl. 112-152.000

Hesterberg, F., & Sohne, Firma: *See—*
Sickel, Hans-Werner, 3,664,695.

Heyl, Walter, to Linde A.G. Power transmission with internal power distribution. 3,664,128, Cl. 60-53.

Heynick, Louis N.: *See—*
Spindt, Charles A.; and Heynick, Louis N.,3,665,241.

Hibbard, Haines C., to Esso Production Research Company. Determination of ice thickness. 3,665,466, Cl. 343-12.00r

Higashikuze, Michiaki: *See—*
Ikai, Masaru; Ishii, Toshikazu; and Higashikuze, Michiaki,3,664,069.

Higgason, Frank G., Jr.; and Sehnert, Robert J., to Ludlow Typograph Company. Apparatus for the production of coded intelligence on a record medium. 3,664,577, Cl. 234-15.

Higuchi, Masaru: *See—*
Takasu, Itaru; Higuchi, Masaru; and Hotta, Hiroshi,3,665,015.

Hikosaka, Mitsuo. On-line real time data processing system. 3,665,416, Cl. 340-172.5

Hilbert, Edward E.: *See—*
United States of America,National Aeronautics and Space Administration, Administrator, 3,665,417.

Hild, Henry F.; Manecke, Siegfried E.; and Shaw, James L., to Robertshaw Controls Company. Thermostatic control device and system utilizing the same. 3,665,362, Cl. 337-322.

Hill, Menno E. Massage table. 3,664,333, Cl. 128-52.

Hille, Dale H., Company: *See—*
Hille, Dale H., 3,664,679.

Hille, Dale H., to Hille, Dale H., Company. Stabilizing device for trucks. 3,664,679, Cl. 280-81.00r

Hilliard, Merle: *See—*
Sunderman, Elwin; and Hilliard, Merle,3,664,677.

Hillier, Malcolm Edwin, to Marbaix, Gaston E., Limited. Nailing and like guns. 3,664,563, Cl. 227-7.

Hills, William A.; and Volpp, Gert P., to FMC Corporation. Tricarboxystarch derivatives. 3,665,000, Cl. 260-233.3

Hinkle, Oliver E.: *See—*
Carothers, Olen E.; and Hinkle, Oliver E.,3,664,550.

Hinrichs, Kurt; and Wilken, Gerd, to ERC Electronic Research Corporation. Digital tape error recognition method utilizing complementary information. 3,665,430, Cl. 340-174.10h

Hirano, Katsuhiko, to Nippon Gakki Seizo Kabushiki Kaisha. Control circuit for sustain keyer circuit in electronic musical instrument. 3,665,091, Cl. 84-1.260

Hirokawa, Yoichi, to Kabushikikaisha Tokyo Keiki Seizosho (Tokyo Keiki Seizosho Co., Ltd.). Autopilot for ship. 3,665,281, Cl. 318-588.

Hirokawa, Yoichi; and Sato, Masatoshi, to Kabushikikaisha Tokyo Keiki (Tokyo Keiki Co., Ltd.). Inverter. 3,665,289, Cl. 321-45.

Hirota, Nobuyoshi; and Onoshima, Yoshio, to Mitsubishi Jukogyo Kabushiki Kaisha. Formaldehyde-gelatin composition for gas pressure testing which forms a long lasting foam. 3,664,965, Cl. 252-408.

Hirsch, Robert L., to International Telephone and Telegraph Corporation. Electrostatic containment in fusion reactors. 3,664,920, Cl. 176-1.

Hiscox, Leonard R., to Girling Limited. Braking systems for vehicles. 3,664,712, Cl. 303-21.

Hitachi, Ltd.: *See—*
Kanda, Kimio, 3,664,743.
Kotera, Nobuo; and Katayama, Yoshifumi, 3,665,190.
Sakabe, Akira; and Sugimoto, Kinji, 3,665,149.
Sekine, Kenji; and Kaneko, Yoichi, 3,665,341.

Ho, Irving T.; Howell, Peter E.; and Jen, Teh-Sen, to International Business Machines Corporation. Monolithic bipolar convertible static shift register. 3,665,210, Cl. 307-238.

Hoch, Geraldine H.: *See—*
Weber, Kenneth E.; Hoch, Geraldine H.; and Wanamaker, John L.,3,664,808.

Hock, Fromund, to Leitz, Ernst, GmbH. Optical apparatus for measurement of a spatial function. 3,664,750, Cl. 356-167.000

Hoerner Waldorf Corporation: *See—*
Dutcher, Daniel P., 3,664,493.

Hoffman, Stephen J.; and Schonegg, Louis E., to Regency Electronics, Inc. Radio receiver. 3,665,318, Cl. 325-470.

Hoffman-La Roche Inc.: *See—*
Marbet, Roman, 3,665,020.
Ruegg, Rudolf; and Schwieter, Ulrich, 3,665,039.

Hoffmann-La Roche Inc.: *See—*
Bretschneider, Hermann; Klotzer, Wilhelm; and Franzmair, Rudolf, 3,665,012.
Ruegg, Rudolf; and Schmialek, Peter, 3,665,040.

Hogg, Jerry D.: *See—*
Barnett, Elben Ray; and Barnett, Raymond Ray, 3,665,203.

Hokkaido Sugar Company, Ltd.: *See—*
Shimizu, Junichi; and Kaga, Toshio, 3,664,927.

Holbert, Marvin L., Jr., to Gray Tool Company. Tie-back system for underwater completion. 3,664,423, Cl. 166-297.

Holland, Gordon Christopher Yardly, to Lansing Bagnall Limited, mesne. Trolleys. 3,664,465, Cl. 188-10.000

Holland, John Rickman, to Bell Telephone Laboratories, Incorporated. Computer graphics system with edge violation detection. 3,665,410, Cl. 340-172.500

Hollander, Edward F., Jr., to Glass, John P., t/a Cava Industries. Method for making graphite whiskers. 3,664,813, Cl. 23-209.1

Hollander, Irvin, to Tii Dee Products Co. Plastic extrusion apparatus. 3,664,790, Cl. 18-12.

Hollie, Manuel E. Identifying device for documents. 3,664,910, Cl. 161-147.

Hollis, Clint R.: *See—*
Baxter, Robert O.; Hollis, Clint R.; and Evans, Carlton F.,3,664,238.

Holm, Leroy W., to Union Oil Company of California. Oil recovery method using crude oil base soluble oil compositions. 3,664,419, Cl. 166-274.

Holstrom, Allan, to Fasco Industries, Inc. Apartment house intercom system. 3,665,116, Cl. 179-37.000

Honda Giken Kogyo Kabushiki Kaisha: *See—*
Michiuchi, Masayuki, 3,664,209.

Honeywell Inc.: *See—*
Hutch, Frederick S.; and Phares, Bruce G., 3,665,414.
Martin, Ronald L., 3,664,580.

Honeywell Information Systems Inc.: *See—*
Beard, Albert L.; and Hunter, John C., 3,665,415.
Campbell, Donald J.; Heffner, William J.; Jennings, Paul H.; and King, Jane E., 3,665,487.
Ester, Charles E., 3,665,369.

Hooker Chemical Corporation: *See—*
Hacias, Kenneth J., 3,664,852.
Mawson, Desmond Leonard; and Malone, Bernard, 3,664,406.

Hoover Ball and Bearing Company: *See—*
Rupert, Samuel J.; and Ziegler, William E., 3,665,063.

Hopkin, William, to Imperial Smelting Corporation (N.S.C.) Limited. Polytetrafluoroethylene fabrication with hexafluorobenzene. 3,665,067, Cl. 264-127.

Hornung, Stephen A.: *See—*
Stichweh, James H.; Hornung, Stephen A.; and Duckwall, Paul, III,3,665,223.

Horvath, Guy E., to Hercules Packing Corporation. Method of making molded laminate packing. 3,664,908, Cl. 161-113.

Hotta, Hiroshi: *See—*
Takasu, Itaru; Higuchi, Masaru; and Hotta, Hiroshi,3,665,015.

Howard, Arthur G.: *See—*
Sterns, Lorance E.; and Howard, Arthur G.,3,664,458.

Howard, Robert E., to Armco Steel Corporation. Roller entry guide for rod mill. 3,664,074, Cl. 72-250.

Howe, Theodore. Load carrying stacking platforms. 3,664,273, Cl. 108-53.

Howell, Peter E.: *See—*
Ho, Irving T.; Howell, Peter E.; and Jen, Teh-Sen,3,665,210.

Howes Leather Company, Inc.: *See—*
Schrade, Hans Christoph; Del Giudice, William F.; and Wimer, Charles W., 3,664,162.

Hoyt, Ernest B., to Allied Chemical Corporation. Purification of hydrogen peroxide. 3,664,812, Cl. 23-207.000

Hozumi, Shiro; and Kinugasa, Terukazu, to Matsushita Electric Industrial Co., Ltd. Hot dip coating apparatus. 3,664,293, Cl. 118-5.

HTL Industries, Inc.: *See—*
Sitabkhan, Abdul N., 3,664,430.

Hubbel, Cohen & Stiefel: *See—*
Eskay, Marion M., 3,664,603.

Hubbuch, Theodore; Murfree, James A., Jr.; Duncan, William A.; Sandlin, Billy J.; and Nappier, Henry A., to United States of America, Army. Method of making a thermal bed for gas generating. 3,664,969, Cl. 252-438.000

Huber, Walter E., to Dayco Corporation. Endless track. 3,664,715, Cl. 305-38.000
Hubscher, Maurice A.: *See—*
Asker, Gunnar C. F.; and Hubscher, Maurice A.,3,664,095.
Asker, Gunnar C. F.; and Hubscher, Maurice A.,3,664,253.
Hudis, Michael I., to Rex Chainbelt Inc. Vehicle for carrying agricultural or construction tools and the like. 3,664,448, Cl. 180-9.46
Hudson, Doyle R., to Olinkraft, Inc. Bag stack holding and separating device. 3,664,659, Cl. 271-18.000
Huffman, William A., to Minnesota Mining and Manufacturing Company. Heat-sensitive copy-sheet. 3,664,858, Cl. 117-36.8
Huffmann, Billy J.: *See—*
Hartmann, Frederick; and Huffmann, Billy J.,3,665,419.
Hughes Aircraft Company: *See—*
Bales, Walter D., III; and Cosand, Neal H., 3,665,250.
Kaspaul, Alfred F., 3,664,249.
Sinker, Robert A.; and Williams, George L., 3,665,226.
Skehan, Bernard J., 3,665,282.
Hughes, Nigel: *See—*
Berrie, Alistair Howard; and Hughes, Nigel,3,664,996.
Hugo, Etienne: *See—*
Machon, Raymond; Flechet, Jean; and Hugo, Etienne,3,664,805.
Hugot, Andre Albert, to Compagnie Electro-Mecanique. Mercury vapour lamp. 3,665,235, Cl. 313-23.000
Hunter, Calvin W., to Clark Equipment Company. Lateral shuttle device for material storage system. 3,664,534, Cl. 214-730.
Hunter, John C.: *See—*
Beard, Albert L.; and Hunter, John C.,3,665,415.
Hurlburt, Joseph C., to Sperry Rand Corporation. Crop gathering and converging reel. 3,664,101, Cl. 56-220.
Hurth, Carl, Maschinen-und Zahnradfabrik: *See—*
Fischer, Heinrich R., 3,664,227.
Hutch, Frederick S.; and Phares, Bruce G., to Honeywell Inc. Multipoint recorder with solid state programmer. 3,665,414, Cl. 340-172.5
Huyck Corporation: *See—*
Price, Kenneth R., 3,664,907.
Hyde, Eric Ambrose, to British Iron and Steel Research Association, The. Release mechanism. 3,664,702, Cl. 294-69.
Hyldon, Roy G., to Quaker Oats Company, The. Process for preparing instant grits. 3,664,846, Cl. 99-83.000
Hyldon, Roy G., to Quaker Oats Company, The. Process for preparing instant corn grits. 3,664,847, Cl. 99-83.
Hyster Company: *See—*
Schwab, Delmar G., 3,664,129.
Ibach, William F.; Looney, Franklin S., Jr.; and Reitz, David C., to Du Pont de Nemours, E. I., and Company. Press free textile fabric. 3,664,381, Cl. 139-420.
Ida, Sagamihara Keisuke: *See—*
Suzuki, Akira; and Ida, Sagamihara Keisuke,3,664,771.
Ideal Toy Corporation: *See—*
Weiss, Gerhart; and Ensmann, Burt W., 3,664,673.
Igarashi, Ryo: *See—*
Nakanuma, Sho; Tsujide, Tohru; Wada, Toshio; Igarashi, Ryo; and Onoda, Katsuhiro,3,665,423.
Igel, John J.; and Schettl, Myron D., to International Business Machines Corporation. Data recorder and verifier. 3,665,403, Cl. 340-172.5
IIT Research Institute: *See—*
van den Heuvel, Anthony P.; Owen, Ronald B.; and Joshi, Shrinivas G., 3,665,225.
Iizuka, Hajime: *See—*
Kawai, Hidetoshi; Iizuka, Hajime; Shinkai, Takuo; and Yoshioka, Yoshiro,3,665,398.
Ikai, Masaru; Ishii, Toshikazu; and Higashikuze, Michiaki, to Toray Industries, Inc. Pneumatic shell structures constructed from synthetic resin films. 3,664,069, Cl. 52-2.
Ikebata, Shigeki: *See—*
Kurahashi, Koichiro; and Ikebata, Shigeki,3,665,246.
Ikeda, Kazuhiro, to Messrs. Kabushiki Kaisha Mitachi Onkyo Seisakusho. Cartridge for pickup. 3,665,123, Cl. 179-100.41
Iles, Brian Rodney: *See—*
Oakes, Vincent; and Iles, Brian Rodney,3,665,024.
Imai, Hiroko: *See—*
Kamiya, Nobuyuki; Funada, Kiyotaka; Shinohara, Takashi; and Imai, Hiroko,3,664,860.
Imai, Toshifumi, to Nippon Kogaku K.K. Contour projector having an optical system which moves in a vertical direction to determine the vertical dimensions of a specimen. 3,664,749, Cl. 356-164.
Imperial Chemical Industries Limited: *See—*
Andrew, Herbert Francis; and Jackson, Neville, 3,664,995.
Ashton, Stanley; and Nicholson, Eric Samuel, 3,665,004.
Berrie, Alistair Howard; and Hughes, Nigel, 3,664,996.
Burrows, Harold George; and Ingham, Philip Brierley, 3,665,054.
Lander, David Robin, 3,664,639.
Imperial Smelting Corporation (N.S.C.) Limited: *See—*
Hopkin, William, 3,665,067.
Inagaki, Shotaro: *See—*
Kuramoto, Yoshio; and Inagaki, Shotaro,3,664,246.
Indak Manufacturing Corporation: *See—*
Schaad, William J.; and Schmidt, Fred N., 3,665,128.
Industrias Sigma, S.A.: *See—*
Mejia, Salvador, 3,665,150.
Industrie A. Zanussi S.p.A.: *See—*
Mazza, Lamberto, 3,664,159.
Information Magnetics Corporation: *See—*
Gillum, Daniel L.; and Gillum, Donald E., 3,665,433.
Ingersoll Milling Machine Company, The: *See—*
Clark, Stephen C., Jr., 3,664,066.
Ingersoll-Rand Company: *See—*
Treible, Edwin S., Jr., 3,664,183.
Ingham, Philip Brierley: *See—*
Burrows, Harold George; and Ingham, Philip Brierley,3,665,054.
Inoue, Isaburo: *See—*
Iwama, Masabuni; Inoue, Isaburo; Takei, Yutaka; and Endo, Takaya,3,664,841.
Institut de Recherche de l'Hydro Quebec Varennes: *See—*
Zajic, Vladislav, 3,665,249.
Institut de Recherches de la Siderurgie Francaise: *See—*
Dumont-Fillon, Jacques; and Roederer, Charles, 3,665,085.
Institut fur Silikon-und Fluorkarbon-Chemie: *See—*
Reichel, Sigrid, 3,665,027.
Institute for Industrial Research and Standards: *See—*
Broderick, Rory Wilson, 3,664,548.
Institutul Politehnic Cluj: *See—*
Kelemen, Arpad; and Crivii, Mircea, 3,665,498.
Instrumentation Laboratory, Inc.: *See—*
Spergel, Philip; and Gaines, Stanley L., 3,664,178.
Intercontinental Systems, Inc.: *See—*
Arjani, Farouk D.; Campbell, Kenneth C.; and Smeins, Craig B., 3,664,479.
Intermenua (Proprietary) Limited: *See—*
Breetvelt, Emile, 3,664,221.
International Business Machines Corporation: *See—*
Alstad, John K.; Armitage, John D., Jr.; and Bate, Geoffrey, 3,665,431.
Benson, Allen B.; and Hatley, Elbert Troy, 3,665,513.
Bouricius, Willard G.; Carter, William C.; Roth, John P.; and Schneider, Peter R., 3,665,173.
Bouricius, Willard G.; Carter, William C.; Duke, Keith A.; Roth, John P.; and Schneider, Peter R., 3,665,174.
Bouricius, Willard G.; Carter, William C.; Roth, John P.; and Schneider, Peter R., 3,665,175.
Bouricius, Willard Gail; Carter, William Caswell; Roth, John Paul; and Schneider, Peter Robert, 3,665,418.
Havas, Janos; and Lechaton, John S., 3,664,942.
Ho, Irving T.; Howell, Peter E.; and Jen, Teh-Sen, 3,665,210.
Igel, John J.; and Schettl, Myron D., 3,665,403.
Lipp, James, 3,664,737.
Mueller, Francis E., 3,665,437.
Prentky, Peter I.; and Wilson, Alonzo A., 3,665,327.
Thornley, Richard F. M., 3,665,429.
Watkins, Robert V., 3,665,103.
International Computers Limited: *See—*
Foster, Alan, 3,665,484.
International Harvester Company: *See—*
Connor, Donald E.; and Boetto, Charles, 3,664,434.
Keller, Arthur H., 3,664,107.
International Paper Company: *See—*
Baxter, Robert O.; Hollis, Clint R.; and Evans, Carlton F., 3,664,238.
Boucher, Wilfred M.; Kurilla, John; and Slepp, Alice C., 3,664,335.
International Standard Electric Corporation: *See—*
Maillot, Jean-Paul, 3,665,189.
Trok, Benjamin, 3,665,290.
International Telephone and Telegraph Corporation: *See—*
Gatwood, Robert K., 3,665,222.
Hirsch, Robert L., 3,664,920.
Poylo, Michael C., 3,665,087.
Ionics, Incorporated: *See—*
Paton, Neil E., 3,664,832.
Iowa State University Research Foundation: *See—*
Quick, Graeme R., 3,664,349.
Irik, Gijsbert Waldemar: *See—*
Boersma, Rintje; and Irik, Gijsbert Waldemar,3,665,135.
Irons, Brian Pemberton Gyles, to Lucas, Joseph, (Industries) Limited. Couplings for connecting two components. 3,664,693, Cl. 287-111.000
Ishii, Toshikazu: *See—*
Ikai, Masaru; Ishii, Toshikazu; and Higashikuze, Michiaki,3,664,069.
Ishimatsu, Tsuyoshi; Ito, Takashi; Yano, Masamitsu; Takeda, Hajime; and Nagano, Kentaro, to Asahi Glass Co., Ltd. Ni Cr Co alloys turbine blade with chromium diffusion layer. 3,664,765, Cl. 416-241.
Isikov, Sergei Alexandrovich: *See—*
Tatianko, Nikolai Vasilievich; Tsymbal, Alexandr Gavrilovich; Stetsenko, Vladimir Vasilievich; Isikov, Sergei Alexandrovich; Rodenko, Fedor Leontievich; Betcher, Alexandr Samuilovich; Shamrai, Petr Dmitrievich; Dulya, Mikhail Afanasievich; Dudka, Viktor Vasilievich; Klimchuk, Ivan Petrovich; and Dolgov, Anatoly Mikhailovich,3,664,431.
Isomura, Shuichi: *See—*
Fujii, Masaru; Sagara, Kazuo; and Isomura, Shuichi,3,665,276.
Itek Corporation: *See—*
Case, Laura K., 3,664,836.

Ito, Katsunori: *See—*
Kato, Takaaki; Kawakubo, Mamoru; Ito, Katsunori; and Wakamatsu, Hisato,3,665,213.
Ito, Takashi: *See—*
Ishimatsu, Tsuyoshi; Ito, Takashi; Yano, Masamitsu; Takeda, Hajime; and Nagano, Kentaro,3,664,765.
Itoi, Kazuo: *See—*
Tanomura, Masahisa; and Itoi, Kazuo,3,664,979.
Ivanhoe Research Corporation: *See—*
Hawley, George F.; and Buettner, John H., 3,664,657.
Ives, Andrew Peter, to Lucas, Joseph, (Industries) Limited. Road vehicle electrical system with transducers detecting faults and producing unique outputs operating a receiving and display unit. 3,665,384, Cl. 340-52.
Iwama, Masabuni; Inoue, Isaburo; Takei, Yutaka; and Endo, Takaya, to Konishiroku Photo Industry Co., Ltd. Light-sensitive silver halide color photographic emulsion containing yellow-forming coupler. 3,664,841, Cl. 96-100.000
Iwanami, Masaru: *See—*
Murakami, Masuo; Iwanami, Masaru; Kubo, Kazuo; Sano, Kenji; Kochiya, Masahiro; and Arima, Hideki,3,665,037.
Iwanciow, Bernard L.; and Chase, Robert A., to United States of America, Navy, mesne. Supported grain design for high acceleration rocket motors. 3,664,133, Cl. 60-255.000
Iwatsu Electric Co., Ltd.: *See—*
Nakaya, Naohisa, 3,665,324.
Izawa, Shinichi: *See—*
Nakanishi, Atsuo; Izawa, Shinichi; and Sato, Mikio,3,664,977.
Jachimek, Thomas P.; and Wrabel, James A., to Seeburg Corporation of Delaware, The. Pulse generator. 3,665,208, Cl. 307-106.
Jackson, Neville: *See—*
Andrew, Herbert Francis; and Jackson, Neville,3,664,995.
Jackson, Wilbur F.; and Willson, James R., to Robertshaw Controls Company. Non-linear temperature responsive valve assemblies. 3,664,582, Cl. 236-93.
Jacques Guillon/Designers Inc.: *See—*
Labastrou, Roger, 3,664,011.
Jacyno, Anthony, to Murphy, G. W., Industries, Inc. Modular design-dougle insulated field. 3,665,228, Cl. 310-47.000
Jaffe, Joseph, to Chevron Research Company. Hydrothermal method for manufacturing a hydrocarbon conversion catalyst containing at least one hydrogenating component. 3,664,971, Cl. 252-455.
Jaffe, Joseph, to Chevron Research Company. Hydrothermal method for manufacturing a catalytic material useful in preparing catalysts for hydrocarbon conversion processes. 3,664,972, Cl. 252-455.
Jaffe, Joseph, to Chevron Research Company. Hydrothermal method for manufacturing a novel catalytic material, catalysts containing said material, and processes using said catalysts. 3,664,973, Cl. 252-455.
Jakszt, Werner; Schiele, Gert; and Werner, Wolfgang, to Siemens Aktiengeselischaft. Overvoltage arrester. 3,665,255, Cl. 317-68.
James, Robert C.; Wilson, David A.; and Pringle, Frank E., Jr., to Hayssen Manufacturing Company. Gas flushing system for vertical form, fill and seal machines. 3,664,086, Cl. 53-112.
Jamshidi, Khosrow. Fruits and nuts picking device. 3,664,104, Cl. 56-332.
Janssen, Joannes Franciscus Maria: *See—*
Van Esdonk, Johannes; and Janssen, Joannes Franciscus Maria,3,665,238.
Jansz, Joost Werner, to Nederlandse Maatschappij voor Werken Buitengaats (Netherlands Offshore Company) N.V. Method of burying an object in the soil. 3,664,142, Cl. 61-72.400
Japan Business Automation Co., Ltd. Tokyo Shibaura Electric Co., Ltd.: *See—*
Oya, Tsutom; and Ebine, Kiyoshi, 3,665,435.
Jarrett, James Harold: *See—*
Wolder, Ernest Harold; and Jarrett, James Harold,3,664,271.
Jarvis, Michael, said Jarvis assor. of 50% to Goldman, Paul. Radio alarm system. 3,665,312, Cl. 325-54.
Jason, Alfred Charles: *See—*
Lees, Alexander; Richards, John Charles Shenstone; and Jason, Alfred Charles,3,665,302.
Jatho, George W.; and Kint, Louis F., to Wrightway Engineering Co. Aerating device. 3,664,589, Cl. 239-428.5
Jaworski, Eugene: *See—*
Glass, Marvin I.; Breslow, Jeffrey D.; and Jaworski, Eugene,3,664,670.
J/B Industries, Inc.: *See—*
May, Eugene NOel, 3,665,132.
Jeffers, Michael F., to Jerrold Electronics Corporation. Maximum channel utilization using single ended amplifiers in a frequency band greater than one octave. 3,665,316, Cl. 325-308.
Jeffries, Neal P.: *See—*
Zerkle, Ronald D., 3,664,412.
Jelfo, Raymond L., to Xerox Corporation. Photoelectrophoretic reversal imaging using a suspension containing a vitamin precursor, B-carotene. 3,664,941, Cl. 204-181.
Jen, Teh-Sen: *See—*
Ho, Irving T.; Howell, Peter E.; and Jen, Teh-Sen,3,665,210.
Jenn-Air Corporation: *See—*
Zintel, James F., 3,664,082.
Jennings, Paul H.: *See—*
Campbell, Donald J.; Heffner, William J.; Jennings, Paul H.; and King, Jane E.,3,665,487.
Jensen, Donald F.: *See—*
Draughon, Roland C.; Jensen, Paul D.; and Jensen, Donald F.,3,664,792.
Jensen, Paul D.: *See—*
Draughon, Roland C.; Jensen, Paul D.; and Jensen, Donald F.,3,664,792.
Jerrold Electronics Corporation: *See—*
Jeffers, Michael F., 3,665,316.
Yastrov, Henry, 3,665,333.
Jex, Henry R., to Systems Technology, Inc. Apparatus for determining eye point-of-regard. 3,664,731, Cl. 351-7.
Jintan Terumo Co., Ltd.: *See—*
Koremura, Norio, 3,664,814.
Johnsen, Erich Cornelius, to Eltico Manufacturing Ltd. Tire air pressure detection and signalling device. 3,665,388, Cl. 340-58.
Johnson, Arthur F. Effluent filtering process and apparatus for aluminum reduction cell. 3,664,935, Cl. 204-67.000
Johnson, Dwight N., to Singer Company, The. Pressure reducing regulator. 3,664,369, Cl. 137-484.400
Johnson, Ray M., to Cryodry Corporation. System for applying microwave energy to a lossy cylindrical object. 3,665,142, Cl. 219-10.550
Johnson, Richard H.: *See—*
Partain, James H.; and Johnson, Richard H.,3,664,573.
Johnson, Ronald C., to General Fireproofing Company, The. Drawer suspension. 3,664,716, Cl. 308-3.8
Johnson, Wallace E. Vacuum-freezing, ejector absorption solution separation systems and methods. 3,664,145, Cl. 62-58.
Johnston, Orin B. Inflatable kite with releasable accessory. 3,664,613, Cl. 244-155.00r
Jolles, Georges, to Phone-Poulenc S.A. Naphthacene derivatives. 3,665,018, Cl. 260-365.
Jones, Donald B.: *See—*
Saraceno, Anthony J.; Walters, Reed H.; Jones, Donald B.; and Wiehle, William E.,3,664,950.
Jones, Eugene G. Apparatus for preventing pollution from offshore oil wells. 3,664,429, Cl. 169-2.00r
Jones, Evan Thomas, to Eastman Kodak Company. Multiple scintillator layers on photographic elements. 3,664,839, Cl. 96-82.
Jones, John Paul, Jr.: *See—*
Peroni, Peter A.; and Jones, John Paul, Jr.,3,664,014.
Jonsereds Fabrikers Aktiebolag: *See—*
Mattsson, Leif Erling M.; and Fredriksson, Karl Garry Kenneth, 3,664,390.
Jordan, Frederick A. Carburetor vapor superheater. 3,664,646, Cl. 261-23.
Jordan, George V., to Selas Corporation of America. Filter tubes in a resilient holder. 3,664,507, Cl. 210-323.
Jordan, William E., to Xerox Corporation. Belt assembly for use in an electrostatic printing machine. 3,664,204, Cl. 74-219.
Jorgensen, Jens L.: *See—*
Harrington, Thomas L.; and Jorgensen, Jens L.,3,664,242.
Joseph, Robert John, to Xerox Corporation. Apparatus for treating the surface of an electrostatographic imaging plate. 3,664,300, Cl. 118-637.
Joshi, Shrinivas G.: *See—*
van den Heuvel, Anthony P.; Owen, Ronald B.; and Joshi, Shrinivas G.,3,665,225.
Jotwani, Haresh C.: *See—*
Blake, Richard K.; and Jotwani, Haresh C.,3,665,112.
Julie, Loebe, to Julie Research Laboratories, Inc. Precision converter/amplifier utilizing a comparator network and a pair of internal signal sources. 3,665,322, Cl. 328-3.
Julie Research Laboratories, Inc.: *See—*
Julie, Loebe, 3,665,322.
Jumberca, S.A.: *See—*
Dalmau Guell, Jose Maria, 3,664,155.
Jungjohann, Vernon H.; and Hagin, John D., to Eastman Kodak Company. Single-frame film apparatus. 3,664,736, Cl. 352-84.000
Junker, Jurgen; and Schleupen, Richard, to Bosch, Robert, GmbH. Arrangement for the electrolytic removal of metal. 3,664,945, Cl. 204-228.000
Kabelschlepp Gesellschaft mit beschrankter Haftung: *See—*
Heidrich, Klaus; Krewitt, Alfred; Loos, Kurt; and Pithan, Fritz, 3,664,619.
Kabushiki Kaisha Komatsu Seisakusho (Komatsu Ltd.): *See—*
Aoki, Yasuo, 3,664,777.
Kabushiki Kaisha Meikiseisakusho: *See—*
Yamauchi, Toshio, 3,664,524.
Kabushiki Kaisha Ricoh: *See—*
Saito, Tadashi; Shimada, Masaru; and Sakai, Koyoshi, 3,664,840.
Kabushiki-Kaisha Tokai Rika Denki Seisakusho: *See—*
Suzuki, Masaru, 3,665,130.
Kabushikikaisha Tokyo Keiki Seizosho (Tokyo Keiki Seizosho Co., Ltd.): *See—*
Hirokawa, Yoichi, 3,665,281.
Sato, Shosuke; Saito, Shigeru; and Kobayashi, Saburo, 3,665,309.
Kabushikikaisha Tokyo Keiki (Tokyo Keiki Co., Ltd.): *See—*
Hirokawa, Yoichi; and Sato, Masatoshi, 3,665,289.
Kabushikikaisha Yokogawa Denki Seisakusho (Yokogawa Electric Works, Ltd.): *See—*
Fuchie, Tadayoshi, 3,665,216.
Kaga, Toshio: *See—*
Shimizu, Junichi; and Kaga, Toshio,3,664,927.

Kaiser Aluminum & Chemical Corporation: *See*—
Finnegan, Walter D., 3,664,816.
Kakuta, Hiroshi, 2/3 to Ajinomoto Co., Inc. Quick setting and quick hardening cement and method for producing the same. 3,664,854, Cl. 106-90.
Kaliko, Olga Romanovna: *See*—
Menyailo, Anatoly Tikhonovich; Pospelov, Mikhail Valerievich; Kaliko, Olga Romanovna; Pokrovskaya, Inna Evgenievna; Fedorova, Valentine Vsevolodovna; Shilnikova, Albina Georgievna; Yakovleva, Antonina Karpovna; and Narozhenko, Tamara Georgievna,3,664,810.
Kalkowski, Kurt-Ulrich. Anti-dazzle spectacles for motorists. 3,664,733, Cl. 351-45.000
Kalle Aktiengesellschaft: *See*—
Raether, Siegfried, 3,664,934.
Kallins, Charles: *See*—
United States of America,National Aeronautics and Space Administration, Administrator, 3,664,185.
Kallstrom, Olof Krister: *See*—
Bergqvist, Mats Soren; Kallstrom, Olof Krister; Lagerberg, Per Goran Olof; and Okvist, Nils Axel Gunnar,3,664,825.
Kalning, Frederick E.: *See*—
Redman, Howard E.; and Kalning, Frederick E.,3,664,280.
Kalopissis, Gregoire; and Bugaut, Andree, to Societe Anonyme dite: L'Oreal. Dye forming nitroparaphenylene- diamine sulfonyl derivatives. 3,665,036, Cl. 260-556.
Kalopissis, Gregorire; and Abegg, Jean-Louis, to L'Oreal. Method of improving the cosmetic properties of hair by using an aldehyde solution. 3,665,072, Cl. 424-70.000
Kambayashi, Akira; Shun-ichi, Kawasaki; and Ehara, Takashi, to Nippon Kokan Kabushiki Kaisha. High tensile steel having high notch toughness. 3,664,830, Cl. 75-124.
Kamiya, Nobuyuki; Funada, Kiyotaka; Shinohara, Takashi; and Imai, Hiroko, to Nihon Kagaku Kizai Kabushiki Kaisha. Electrolessly nickel plating on a non-metallic basis material. 3,664,860, Cl. 117-47.00a
Kanda, Kaoru: *See*—
Kimura, Takashi; Kumagai, Kazuo; and Kanda, Kaoru,3,665,432.
Kanda, Kimio, to Hitachi, Ltd. Spectrophotometer. 3,664,743, Cl. 356-83.
Kane, Patrick A. Convertible snowmobile. 3,664,447, Cl. 180-5.
Kaneda, Isao; and Takeuchi, Kiyokazu, to New Nippon Electric Company Ltd. Discharge-lamp operating device using thyristor oscillating circuit. 3,665,243, Cl. 315-101.
Kaneko, Yoichi: *See*—
Sekine, Kenji; and Kaneko, Yoichi,3,665,341.
Kansai Paint Company Limited: *See*—
Okamura, Seizo; Odan, Koji; and Maruyama, Tsutomu, 3,664,861.
Karasev, Mikhail Andreevich: *See*—
Shtin, Lev Mikhailovich; Grebnev, Nikolai Feodosovich; Satovskaya, Ljudmila Sergeevna; Rasseikin, Mikhail Grigorievich; Khirdzhiev, Sergei Grigorievich; Perevozchikov, Evgeny Titovich; Zagulina, Sofia Stepanovna; Duda, Vladimir Nikolaevich; and Karasev, Mikhail Andreevich,3,664,168.
Karinthi, Pierre: *See*—
Spire, Etienne; and Karinthi, Pierre,3,664,652.
Karlsson, Lauri E. Card file. 3,664,048, Cl. 40-65.
Kartchner, Earl M.; Van Horn, Gary R.; and Wallace, Richard A., to Sperry Rand Corporation. Two-way communication system employing two-clock frequency pseudo-noise signal modulation. 3,665,472, Cl. 343-175.000
Kartridge-Pak Co., The: *See*—
Rousseau, Roy S.; Keating, Raymond J.; and Steinke, Gary L., 3,664,085.
Kaspaul, Alfred F., to Hughes Aircraft Company. Image exposure and development method and apparatus. 3,664,249, Cl. 95-13.
Kaspers, Helmut: *See*—
Buchel, Karl Heinz; Regel, Erik; Grewe, Ferdinand; Scheinpflug, Hans; and Kaspers, Helmut,3,665,076.
Buchel, Karl-Heinz; Regel, Erik; Grewe, Ferdinand; Scheinpflug, Hans; and Kaspers, Helmut,3,665,077.
Buchel, Karl-Heinz; Regel, Erik; Grewe, Ferdinald; Scheinpflug, Hans; and Kaspers, Helmut,3,665,078.
Buchel, Karl-Heinz; Regel, Erik; Grewe, Ferdinand; Scheinpflug, Hans; and Kaspers, Helmut,3,665,079.
Katayama, Yoshifumi: *See*—
Kotera, Nobuo; and Katayama, Yoshifumi,3,665,190.
Kato, Takaaki; Kawakubo, Mamoru; Ito, Katsunori; and Wakamatsu, Hisato, to Nippondenso Kabushiki Kaisha. Gear position signal generating system for electric-type automatic transmissions. 3,665,213, Cl. 307-218.
Kato, Tomotake: *See*—
Yoshikawa, Yoshio; Kondo, Hiroshi; Sugio, Akitoshi; and Kato, Tomotake,3,664,035.
Katz, Isadore Edward: *See*—
Grane, Henry R.; and Katz, Isadore Edward,3,665,048.
Kaufman, Harold B., Jr.: *See*—
Schiffmann, Robert F.; Stein, Ernest W.; and Kaufman, Harold B., Jr.,3,665,141.
Kawahara, Kazuhiro: *See*—
Yamamoto, Mititaka; Kawahara, Kazuhiro; and Morita, Tadao,3,665,162.
Kawai, Hidetoshi; Iizuka, Hajime; Shinkai, Takuo; and Yoshioka, Yoshiro, to Kogyo Gijutsuin, a/k/a Agency of Industrial Science and Technology, Ministry of International Trade and Industry. Input/output multiplex control system. 3,665,398, Cl. 340-147.000
Kawakubo, Mamoru: *See*—
Kato, Takaaki; Kawakubo, Mamoru; Ito, Katsunori; and Wakamatsu, Hisato,3,665,213.
Kaye, Howard, to Research Corporation, mesne. Vinyl-substituted pyrimidines and purines and polymers thereof. 3,664,991, Cl. 260-29.6
Kaylor, Karl Lester: *See*—
Hammell, Kemper Martel; and Kaylor, Karl Lester,3,665,378.
Kazmarek, Edward, to Lear Siegler, Inc. Compact servo actuator. 3,665,278, Cl. 318-466.
Keating, Raymond J.: *See*—
Rousseau, Roy S.; Keating, Raymond J.; and Steinke, Gary L.,3,664,085.
Keck, Dieter, to C. Keller u. Co. Equipment for forming a stack of bricks or other articles and for interleaving successive layers with thermoplastic film material. 3,664,089, Cl. 53-199.
Kees, F. D., Manufacturing Co.: *See*—
Schaefer, George J., Jr., 3,664,367.
Keiles, Yoel; Kelley, Fred W., Jr.; and Lezan, Georges R. E., to General Electric Company. Phase-controlled static switch for a power circuit having a variable power factor. 3,665,293, Cl. 323-24.
Keith, Constant E. Head attached safety light. 3,665,451, Cl. 340-321.000
Kelbel, Donald. Hand drill alignment devices and methods of making and using the same. 3,664,754, Cl. 408-16.
Kelemen, Arpad; and Crivii, Mircea, to Institutul Politehnic Cluj. Speed regulation system for three-phase induction motor. 3,665,498, Cl. 318-227.
Keller, Arthur H., to International Harvester Company. Rake tooth mounting. 3,664,107, Cl. 56-400.000
Keller, Ernst: *See*—
Peterli, Hans Jakob; Keller, Ernst; and Schwarzenbach, Kurt,3,665,031.
Keller, Joseph D.; and Osborne, Solomon C., to Martin Marietta Corporation. Side hole terminal. 3,665,367, Cl. 339-275.
Kelley Company, Inc.: *See*—
Hazlewood, John F.; and Ruehl, Herbert T., 3,664,075.
Kelley, Fred W., Jr.: *See*—
Keiles, Yoel; Kelley, Fred W., Jr.; and Lezan, Georges R. E.,3,665,293.
Kelly, Jerry D.; and Beck, Forrest E. Stain remover. 3,664,962, Cl. 252-125.
Kelsey, Newton D., to Ruth, Arthur P. Ambient light level detector including transient suppression circuitry. 3,665,224, Cl. 307-311.
Kelsey-Hayes Company: *See*—
Every, Peter, 3,664,714.
Riordan, Hugh E.; and Moncher, Frank L., 3,664,713.
Rozmus, Walter J., 3,664,566.
Kenics Corporation: *See*—
Grout, Kenneth M.; and Devellian, Richard D., 3,664,638.
Kennedy, Bert. Boxing glove. 3,663,960, Cl. 2-18.000
Kennedy, James; Long, Alan Gibson; and Underwood, William G. E., to Glaxo Laboratories Limited. Cephalosporin compounds. 3,665,003, Cl. 260-243.00c
Kennon, Jerry M.: *See*—
Strandberg, Charles F., Jr.; Strandberg, Robert C.; and Kennon, Jerry M.,3,665,165.
Kentor, William E. Process for preserving meats. 3,664,850, Cl. 99-157.
Kenwal Machine Company, Inc.: *See*—
Wells, Sylvan O., 3,664,394.
Keppler, Johann Georg: *See*—
Feenstra, Willem Hendrik; and Keppler, Johann Georg,3,664,851.
Kerschbaum, Walter E., to Eltra Corporation. Card cage for printed circuit cards. 3,664,510, Cl. 211-41.
Kerst, Al F., to Monsanto Company. Flame resistant polyurethane prepared by adding an ethane diphosphonate into the urethane-forming mixture. 3,664,975, Cl. 260-2.5
Keulen, Gerben Jan; and Kroes, Johannes Petrus, to Bull General Electric (Nederland) N.V. Combined system for receiving and feeding cards. 3,664,658, Cl. 271-9.000
Keyes, Neil T.: *See*—
Sanders, Ray W.; Keyes, Neil T.; and Quan, William,3,665,405.
Keyless Lock Company, Inc.: *See*—
Sterns, Lorance E.; and Howard, Arthur G., 3,664,458.
Khirdzhiev, Sergei Grigorievich: *See*—
Shtin, Lev Mikhailovich; Grebnev, Nikolai Feodosovich; Satovskaya, Ljudmila Sergeevna; Rasseikin, Mikhail Grigorievich; Khirdzhiev, Sergei Grigorievich; Perevozchikov, Evgeny Titovich; Zagulina, Sofia Stepanovna; Duda, Vladimir Nikolaevich; and Karasev, Mikhail Andreevich,3,664,168.
Khusid, Iosif Efimovich; Bezgodova, Ljudmila Ivanovna; and Ruben, Mara Khugovna, to Olainsky Zavod Khimreaktivov. Method for production of cellulose ion exchangers. 3,664,999, Cl. 260-231.
Kidd, Donald D.: *See*—
Tell, Mayo B.; Kidd, Donald D.; Wickham, William T.; and Brown, Frank,3,664,382.
Kiel, Othar M.: *See*—
Graham, John W.; Kiel, Othar M.; Terry, William M.; and Sinclair, Albert R.,3,664,420.

Kiji, Kazuo; Nishida, Nobuo; and Sakaguchi, Mitsuhito, to Nippon Electric Co., Ltd. Three dimensional position indicator and detector device. 3,664,722, Cl. 350-3.5

Kilian Schwizer: *See*—
Koch, Evaristo, 3,664,475.

Kimberly-Clark Corporation: *See*—
Burger, William H., 3,663,962.

Kimura, Takashi; Kumagai, Kazuo; and Kanda, Kaoru, to Fujitsu Limited. Magnetic tape unit reading system. 3,665,432, Cl. 340-174.1

Kincaid, Gary L., to Gray Manufacturing Company, Inc. Vehicle lift. 3,664,635, Cl. 254-8.

King, Jane E.: *See*—
Campbell, Donald J.; Heffner, William J.; Jennings, Paul H.; and King, Jane E.,3,665,487.

King-Seeley Thermos Co.: *See*—
Clark, Robert H., 3,664,322.

Kingsley, Jack D.; and Prener, Jerome S., to General Electric Company. Electron energy sensitive phosphors for multi-color cathode ray tubes. 3,664,862, Cl. 117-100.00b

Kint, Louis F.: *See*—
Jatho, George W.; and Kint, Louis F.,3,664,589.

Kinugasa, Terukazu: *See*—
Hozumi, Shiro; and Kinugasa, Terukazu,3,664,293.

Kiplinger, Dale V.: *See*—
Beatty, Ronald L.; and Kiplinger, Dale V.,3,664,859.

Kipp, Karl F.: *See*—
Frank, Gerard A.; Kipp, Karl F.; and Oswald, Donald R.,3,664,872.

Kirchner, Karl: *See*—
Legler, Ernst; and Kirchner, Karl,3,665,220.

Kirkpatrick, Milton E.; and Mendelson, Ralph A., to TRW Inc. Alloy capacitor porous anodes. 3,665,260, Cl. 317-230.

Kladich, Joseph. Self-centering steady rest chucks. 3,664,216, Cl. 82-38.

Klein, Josef: *See*—
Reifenhauser, Fritz; and Klein, Josef,3,664,796.

Klein, Walter, to Leitz, E., G.m.b.H. Optical system for stereoscopic microscopes. 3,664,724, Cl. 350-54.000

Kleinert, Werner L. Table or seating device. 3,664,275, Cl. 108-150.

Kleingartner, Charles A.: *See*—
Mulkey, Owen R.; Kleingartner, Charles A.; and Zoutte, Arnold A.,3,665,458.

Klemas, Vytautas: *See*—
Sauer, Walter Edwin; and Klemas, Vytautas,3,665,300.

Klessig, Ernst F., to Worthington Corporation (Worthington Compressor and Engine International Division). Hydraulic hammer with automatic stopping action. 3,664,435, Cl. 173-17.000

Klimchuk, Ivan Petrovich: *See*—
Tatianko, Nikolai Vasilievich; Tsymbal, Alexandr Gavrilovich; Stetsenko, Vladimir Vasilievich; Isikov, Sergei Alexandrovich; Rodenko, Fedor Leontievich; Betcher, Alexandr Samuilovich; Shamrai, Petr Dmitrievich; Dulya, Mikhail Afanasievich; Dudka, Viktor Vasilievich; Klimchuk, Ivan Petrovich; and Dolgov, Anatoly Mikhailovich,3,664,431.

Klingensmith, James D.; and Volinsky, George, Jr., to Aluminum Company of America. Nailable wall construction. 3,664,080, Cl. 52-479.

Klint, Robert V., to General Electric Company. Electric circuit breaker with electromagnetically- assisted closing means. 3,665,350, Cl. 335-195.

Klotzer, Wilhelm: *See*—
Bretschneider, Hermann; Klotzer, Wilhelm; and Franzmair, Rudolf,3,665,012.

Knight, William J. Lawn sprinkler with novel pattern control means. 3,664,590, Cl. 239-499.

Knippel, Willis H.: *See*—
Stark, Marvin; and Knippel, Willis H.,3,664,270.

Knodo, Takao; and Takizawa, Haruki, to Teijin Limited. Method of air-conditioning undrawn yarn package in drawing machine. 3,665,070, Cl. 264-290.

Knoop, Donald E.: *See*—
Becker, Stephen A.; and Knoop, Donald E.,3,665,159.

Knox, Kenneth H.; and Ries, Robert J., to Abbott Laboratories. Cap for a medicament vial. 3,664,338, Cl. 128-220.

Knudsen, Jorgen Dahlman; Romer, Bendt Wegge; and Valbjorn, Knud Vagn, to Danfoss A/S. Hermetically enclosed small refrigerating machine. 3,664,769, Cl. 417-312.000

Kobayashi, Hiroomi: *See*—
Tanaka, Atsushi; Kobayashi, Hiroomi; Kudo, Teizo; and Mikumo, Masatoshi,3,665,057.

Kobayashi, Saburo: *See*—
Sato, Shosuke; Saito, Shigeru; and Kobayashi, Saburo,3,665,309.

Kobayashi, Tatsuo; and Maeda, Keisuke, to Minolta Camera Kabushiki Kaisha. Apparatus for interlocking a shutter release with exposure meter settings. 3,664,243, Cl. 95-10.00c

Kobler, Paul. Mechanically held inner knives of shearheads outside said heads on electrical and mechanical shavers. 3,664,019, Cl. 30-41.000

Koch, Evaristo, to Kilian Schwizer. Coin controlled locking device with coin holding means. 3,664,475, Cl. 194-51.000

Kochiya, Masahiro: *See*—
Murakami, Masuo; Iwanami, Masaru; Kubo, Kazuo; Sano, Kenji; Kochiya, Masahiro; and Arima, Hideki,3,665,037.

Kochta, Zdenek; and Dvoracnek, Karel, to Vyzkumny ustav pletarsky. Patterned stitch-bonded fabric. 3,664,157, Cl. 66-190.

Kockott, Dieter, to Original Hanau Quarzlampen GmbH. Apparatus for accelerated testing of the light and weather resisting ability of different materials. 3,664,188, Cl. 73-150.000

Kodis, Ralph D.: *See*—
Haroules, George G.; Brown, Wilfred E., III; Ewen, Harold I.; Lilley, Arthur E.; and Kodis, Ralph D.,3,665,467.

Koechner, Walter, to Union Carbide Corporation. Method and means for sealing laser rods. 3,665,337, Cl. 331-94.500

Koehring Company: *See*—
Brown, Gaylord W., 3,664,791.

Koester, David W.: *See*—
Cornelius, Edward B.; and Koester, David W.,3,665,049.

Kogyo Gijutsuin: *See*—
Kawai, Hidetoshi; Iizuka, Hajime; Shinkai, Takuo; and Yoshioka, Yoshiro, 3,665,398.

Koikeda, Toshiaki: *See*—
Kumagai, Shun; and Koikeda, Toshiaki,3,664,943.

Kojima, Kiyoshi; and Abe, Toshiro, to Matsushita Denko Kabushiki Kaisha. Photosensitive solid oscillator. 3,665,340, Cl. 331-107.

Kojima, Minoru: *See*—
Onishi, Akira; Fujio, Ryota; and Kojima, Minoru,3,665,062.

Kolatorowicz, Edwin E.: *See*—
Born, Norman E.; Kolatorowicz, Edwin E.; and Plumb, Harry A., Jr.,3,665,274.

Kolfertz, Erwin. Pumping apparatus. 3,664,767, Cl. 417-45.000

Kolin, Alexander: *See*—
Luner, Stephen J.; and Kolin, Alexander,3,664,939.

Kolomeitsev, Adolf Petrovich; and Kulikov, Vladimir Igorevich. Mould rocking mechanism in a continuous metal casting plant. 3,664,409, Cl. 164-260.

Komarov, Alexandr Ivanovich: *See*—
Graifer, Valery Isaakovich; Komarov, Alexandr Ivanovich; Lysenko, Vladimir Dmitrievich; Mingareev, Ravkhat Shagimardanovich; and Mukharsky, Enver Davydovich,3,664,418.

Komatsu, Youji; Tamura, Takeshi; Fujii, Kinya; and Hatsutori, Masafumi, to Maruzen Oil Company Limited. Process for the production of carboxylic acids. 3,665,034, Cl. 260-533.

Kombinat Veb Messgeratewerk Zwonitz: *See*—
Martini, Karl; Forster, Peter; Bierbaum, Dieter; and Halm, Gunther, 3,664,472.

Kondo, Eiji; and Mitsugi, Takashi, to Shionogi & Co., Ltd. Degradation of side chain in sapogenins. 3,665,022, Cl. 260-397.3

Kondo, Hiroshi: *See*—
Yoshikawa, Yoshio; Kondo, Hiroshi; Sugio, Akitoshi; and Kato, Tomotake,3,664,035.

Kondur, Louis, to Webb, Jervis B., Company. Safety bumper for driverless vehicle. 3,664,701, Cl. 293-4.

Konishiroku Photo Industry Co., Ltd.: *See*—
Iwama, Masabuni; Inoue, Isaburo; Takei, Yutaka; and Endo, Takaya, 3,664,841.

Konorova, Elena Alexandrovna: *See*—
Kozlov, Stanislav Fedorovich; and Konorova, Elena Alexandrovna,3,665,193.

Kopec, Thomas J.; and Morstadt, Richard A., to Automatic Electric Laboratories, Inc. Monitoring circuit for data sets, with signal muting. 3,665,107, Cl. 179-4.

Koremura, Norio, to Jintan Terumo Co., Ltd. Blood cleaner device. 3,664,814, Cl. 23-258.500

Kornylak, Andrew T. Vertical chain type conveyor with tilting shelves. 3,664,482, Cl. 198-20.

Kosky, Richard P.: *See*—
Diwinsky, Gordon A.; and Kosky, Richard P.,3,664,922.

Kosugi, Takeshi; and Kunimitsu, Toshio, to Nakakita Seisakusho Company Limited. Method of automatic valve control. 3,664,358, Cl. 137-14.

Kotera, Nobuo; and Katayama, Yoshifumi, to Hitachi, Ltd. MOS-FET infrared detector. 3,665,190, Cl. 250-83.3

Kough, Blair B.: *See*—
Martin, Otis M.; Kough, John K.; Miller, Silas M.; and Kough, Blair B.,3,664,081.

Kough, John K.: *See*—
Martin, Otis M.; Kough, John K.; Miller, Silas M.; and Kough, Blair B.,3,664,081.

Kozinski, Allen A.: *See*—
Petersen, Richard D.; and Kozinski, Allen A.,3,664,949.

Kozlov, Stanislav Fedorovich; and Konorova, Elena Alexandrovna, to Ordena Lenina Fizichesky Institut Imeni P.N. Lebedeva Leninsky Prospekt. Diamond nuclear radiation detector. 3,665,193, Cl. 250-83.

Kraemer, Friedrich; Mandel, Jorn; Mayer, Siegfried; Rohrig, Klaus; Schulz, Hans-Peter; Weidenmuller, Hilmar; Haverkamp, Klaus Dieter; and Motz, Jurgen, to Rheinstahl Huttenwerke. Process for accelerating metallurgical reactions. 3,664,826, Cl. 75-50.

Krambeck, Robert Harold, to Bell Telephone Laboratories, Incorporated. Shift register using integrated negative resistance devices. 3,665,214, Cl. 307-221.

Kramer, John B., to Allied Chemical Corporation. LP-gas ram-air charger. 3,664,315, Cl. 123-120.000

Kramer, John B., to Allied Chemical Corporation. Injector. 3,664,818, Cl. 48-180.00r

Kraus, Robert J. Torque wrench. 3,664,186, Cl. 73-139.

Krauss, Walter Francis Henry; and Westmore, Norman Ernest, deceased0 (by Westmore, Anna Mira; executor). Apparatus and method for aligning belt conveyor components such as idler frames and pulleys. 3,664,489, Cl. 198-192.

Krawiec, Donald M., to Combustion Engineering, Inc. Nuclear reactor spring ferrule spacer grid. 3,664,924, Cl. 176-78.

Krebs, Klaus H. Device for the retrieval of data. 3,664,500, Cl. 209-80.5

Kreiss, Manfred, to Erdol-Raffinnerie Mannheim GmbH., mesne. Method and installation for detecting fluid leakage from a pipeline. 3,664,357, Cl. 137-2.

Kremper, Dieter: *See—*
Schiewek, Peter; and Kremper, Dieter,3,664,217.

Krewitt, Alfred: *See—*
Heidrich, Klaus; Krewitt, Alfred; Loos, Kurt; and Pithan, Fritz,3,664,619.

Kroes, Johannes Petrus: *See—*
Keulen, Gerben Jan; and Kroes, Johannes Petrus,3,664,658.

Krueger, A. H., Inc.: *See—*
Krueger, Alfred H., 3,664,618.

Krueger, Alfred H., to Krueger, A. H., Inc. Dual-purpose base for use as a sign support or to form a vehicle barricade. 3,664,618, Cl. 248-44.

Kruger, Heinz: *See—*
Mohl, Wilhelm; and Kruger, Heinz,3,663,968.

Kruger, Michael H., to Smithcraft Corporation. Ceiling fixture support. 3,664,615, Cl. 248-27.

Kubanoff, Jacob H., to United States of America, Army. Fixed target detector for use with doppler radar. 3,665,463, Cl. 343-5.00r

Kubitzek, Harry; Essig, Karl-August; Von Falkai, Bela; Reichle, Alfred; and Bodesheim, Ferdinand, to Farbenfabriken Bayer Aktiengesellschaft. Bifilar compound filaments of polyamides. 3,664,914, Cl. 161-173.

Kubo, Kazuo: *See—*
Murakami, Masuo; Iwanami, Masaru; Kubo, Kazuo; Sano, Kenji; Kochiya, Masahiro; and Arima, Hideki,3,665,037.

Kudo, Teizo: *See—*
Tanaka, Atsushi; Kobayashi, Hiroomi; Kudo, Teizo; and Mikumo, Masatoshi,3,665,057.

Kuechler, Irvin R., 6% to Gausewitz, Carr & Rothenberg. Apparatus and method for removing fumes from the space above a cooking appliance. 3,664,255, Cl. 98-115.

Kuethe, Melvin W., to Martin Marietta Corporation. Deployable shock absorber. 3,664,463, Cl. 188-1.

Kugler, Tibor, to Lonza Ltd. Regulation of plasma generators. 3,665,244, Cl. 315-111.

Kulikov, Vladimir Igorevich: *See—*
Kolomeitsev, Adolf Petrovich; and Kulikov, Vladimir Igorevich,3,664,409.

Kumagai, Kazuo: *See—*
Kimura, Takashi; Kumagai, Kazuo; and Kanda, Kaoru,3,665,432.

Kumagai, Shun; and Koikeda, Toshiaki, to Oki Electric Industry Company Limited. Method of producing tantalum nitride film resistors. 3,664,943, Cl. 204-192.

Kunimitsu, Toshio: *See—*
Kosugi, Takeshi; and Kunimitsu, Toshio,3,664,358.

Kupersmit, Julius B. Molded pallet for palletized containers. 3,664,570, Cl. 229-23.

Kurahashi, Koichiro; and Ikebata, Shigeki, to Mitsubishi Electric Corporation. Solid state display device. 3,665,246, Cl. 315-169.

Kuramoto, Yoshio; and Inagaki, Shotaro, to Minolta Camera Kabushiki Kaisha. Device for restraining a pointer of ammeter for the exposure meter in a camera. 3,664,246, Cl. 95-10.00c

Kuraray Co., Ltd.: *See—*
Harada, Kazuto, 3,665,157.
Tanomura, Masahisa; and Itoi, Kazuo, 3,664,979.

Kurilla, John: *See—*
Boucher, Wilfred M.; Kurilla, John; and Slepp, Alice C.,3,664,335.

Kurokawa, Hideo: *See—*
Yukami, Noboru; Otani, Hiroshi; and Kurokawa, Hideo,3,665,264.

Kuron, Dieter: *See—*
Graefen, Hubert; and Kuron, Dieter,3,664,831.

Kuznetzoff, Philip, to RCA Corporation. Method for making a kinescope comprising production and treatment of a temporary mask. 3,663,997, Cl. 29-25.14

Kyburz, Edgar: *See—*
Schaper, Hans; Springer, Kurt; and Kyburz, Edgar,3,664,946.

Labastrou, Roger, to Jacques Guillon/Designers Inc. Method of making a joinery joint. 3,664,011, Cl. 29-526.

Labofina, Soc. An.: *See—*
DeRadzitzky D'Ostrowick, Pierre; and Hanotier, Jacques D. V., 3,665,030.

Lachnit, Friedrich, to Deutsche Babcock & Wilcox Aktiengesellschaft. Apparatus for supplying pressurized fluid to a rotating device. 3,664,762, Cl. 416-156.

Lafrance, Jean C.: *See—*
Lucas, Edward J.; and Lafrance, Jean C.,3,664,268.

Lagerberg, Per Goran Olof: *See—*
Bergqvist, Mats Soren; Kallstrom, Olof Krister; Lagerberg, Per Goran Olof; and Okvist, Nils Axel Gunnar,3,664,825.

Lahde, Reinhard N., to Lockheed Aircraft Corporation. Brushless D.C. motor driven gyroscope. 3,664,199, Cl. 74-5.6

Laing, James Morrison, to Borg-Warner Limited. Transmission mechanism and method of manufacture thereof. 3,664,210, Cl. 74-753.

L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See—*
Spire, Etienne; and Karinthi, Pierre, 3,664,652.

Lake, Connie. Bag closure. 3,664,575, Cl. 229-62.

Lamkin, Clifford L. Crankcase vapors condensor. 3,664,314, Cl. 123-119.00b

Lancaster, Jesse F., to Cooke Engineering Company. Multi-circuit switching connector. 3,665,129, Cl. 200-51.07

Land, Edwin H., to Polaroid Corporation. Compact variable frame viewfinder. 3,664,250, Cl. 95-44.

Lander, David Robin, to Imperial Chemical Industries Limited. Mixing device. 3,664,639, Cl. 259-4.

Landis Tool Company: *See—*
McIntosh, Michael D., 3,665,279.

La Neve, Angelo L., to ALN Enterprises. Beverage mixer and dispenser. 3,664,643, Cl. 259-44.

Langenhop, John Herman, to AMF Incorporated. Inter-conveyor turn device. 3,664,485, Cl. 198-78.

Lansing Bagnall Limited: *See—*
Holland, Gordon Christopher Yardly, 3,664,465.

Lanza, Franco; and Marengo, Giuseppe, to European Atomic Energy Community (Euratom). Graphite impregnated with bismuth-nickel alloy. 3,664,865, Cl. 117-160.00r

Larkin, Thomas J., to Cartridge Television, Inc. Tape guide system having pick-up elements with conical engaging surfaces for tape course conversion. 3,665,120, Cl. 179-100.2

Larsen, Elmer L., to McGraw-Edison Company. Constant torque device for meter reading system. 3,664,197, Cl. 74-1.500

Latash, Jury Vadimovich: *See—*
Medovar, Boris Izrailevich; Latash, Jury Vadimovich; Bondarenko, Oleg Petrovich; and Bogachenko, Alexsey Georgievich,3,665,080.
Paton, Boris Evgenievich; Lebedev, Vladimir Konstantinovich; Medovar, Boris Izrailevich; Pentegov, Igor Vladimirovich; Latash, Jury Vadimovich; Bondarenko, Oleg Petrovich; Baglai, Vitaly Mikhailovich; Podola, Nikolai Vasilievich; and Emelyanenko, July Georgievich,3,665,081.
Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Bondarenko, Oleg Petrovich; Latash, Jury Vadimovich; Baglai, Vitaly Mikhailovich; and Shirshov, Vladimir Grigorievich,3,665,488.

Latham, Peter A.; and Brefka, Paul E. Game racket with string support insert means. 3,664,669, Cl. 273-73.

Lau, Ralph Rupp; and Sitz, Gilbert Carl, to AMP Incorporated. Method and apparatus for forming an insulated electrical connection. 3,664,218, Cl. 83-81.

Laub, Joseph L., to Unitek Corporation. Arm assembly for bonding apparatus. 3,664,567, Cl. 228-3.

Lauchlan, Robert L.: *See—*
Snodgrass, Hugh E.; and Lauchlan, Robert L.,3,665,058.

Laval, Claude C., Jr.; and Peters, Pete P. Collecting device for submarine oil leakage. 3,664,136, Cl. 61-1.000

Laval, Robert Louis Gustave, to Societe Alsacienne de Constructions. Method of integration of phase, integrator- phasemeter and their applications. 3,665,471, Cl. 343-112.00r

Lavigne, Pierre, to Commissariat a l'Energie Atomique. Implantable artificial heart. 3,663,966, Cl. 3-1.000

LaWarre, Robert W., to Beatrice Foods Co. Apparatus for producing shapes with controlled three dimensions. 3,664,779, Cl. 425-4.

Lawson, Jack M. Drapery pleating pattern means. 3,664,026, Cl. 33-137.000

Lazor, Donald Keith: *See—*
Wallick, Claude Rollin, Jr.; Blodgett, William Edward; and Lazor, Donald Keith,3,664,799.

Leach, Raymond B., to Miracle Hub and Wheel, Inc. Resilient hub. 3,664,710, Cl. 301-136.

Leader, Patricia J.: *See—*
Taylor, Francis R.; Leader, Patricia J.; and Westerdahl, Raymond P.,3,664,898.

Lear Siegler, Inc.: *See—*
Kazmarek, Edward, 3,665,278.
Miller, Justin G., 3,665,465.

Leban, Carl, 33 1/3 to Stanger, Leo. Method and means for encoding and decoding ideographic characters. 3,665,450, Cl. 340-324.

Lebedev, Vladimir Konstantinovich: *See—*
Paton, Boris Evgenievich; Lebedev, Vladimir Konstantinovich; Medovar, Boris Izrailevich; Pentegov, Igor Vladimirovich; Latash, Jury Vadimovich; Bondarenko, Oleg Petrovich; Baglai, Vitaly Mikhailovich; Podola, Nikolai Vasilievich; and Emelyanenko, July Georgievich,3,665,081.

Lechaton, John S.: *See—*
Havas, Janos; and Lechaton, John S.,3,664,942.

Leclair, Albert W., to Nashua Corporation. Thermographic copy sheet containing guanidine compounds. 3,664,842, Cl. 96-114.1

Lee, Henry L., Jr.; Culp, Gordon W.; and Ocumpaugh, David E. Bacteria-resistant percutaneous conduit device. 3,663,965, Cl. 3-1.

Lee, Herbert P. Heating-element protector for electric water- heater. 3,665,156, Cl. 219-333.

Lee, Robert E. Speed indicating device. 3,665,390, Cl. 340-62.

Leeds & Northrup Company: *See—*
Hance, Richard James, 3,664,882.

Lees, Alexander; Richards, John Charles Shenstone; and Jason, Alfred Charles, to National Research Development Corporation. Methods

and apparatus for determining the condition of food. 3,665,302, Cl. 324-64.

Leffers, Hans Ulrik; Romer, Bendt Wegge; and Valbjorn, Knud Vagan, to Danfoss A/S. Oil pump for a motor compressor. 3,664,461, Cl. 184-66.160

Le Gall, Jean Claude. Plural axes gyro-motor light-beam target tracking facility. 3,665,283, Cl. 318-649.000

Legler, Ernst; and Kirchner, Karl, to Fernseh G.m.b.H. Cross-track distributor for video signals. 3,665,220, Cl. 307-254.

Le Grand, Donald G.: *See*—
Gaines, George L., Jr.; and Le Grand, Donald G.,3,664,959.

Leibowitz, William, to Dollac Division, Jacoby-Bender, Inc. Rolling doll dye mounted on an askew axis. 3,664,059, Cl. 46-167.

Leigh Products, Inc.: *See*—
Price, John R., 3,664,625.

Leitz, E., G.m.b.H.: *See*—
Klein, Walter, 3,664,724.

Leitz, Ernst, GmbH: *See*—
Haas, Karl Heinz, 3,664,751.
Hock, Fromund, 3,664,750.

Lejeune, Daniel, to Compagnie Generale des Etablissements Michelin raison sociale Michelin & Cie. Method of making wheels for automotive vehicles. 3,664,000, Cl. 29-159.01

Lejeune, Pierre, to Neyrpic-BMB. Process and apparatus for suspending particles in a liquid. 3,664,096, Cl. 55-466.000

Leland Stanford Junior University, The board of trustees of the: *See*—
Chowning, John M., 3,665,105.

Lender, Adam; and Dotter, Berton E., Jr., to GTE Automatic Electric Laboratories, Incorporated. Data error detector for determining the error rate prior to equalization. 3,665,394, Cl. 340-146.1ax

Lengagne, Paul: *See*—
Fradin, Jean; and Lengagne, Paul,3,664,083.

Lenk, Erich, to Barmag Barmer Maschinenfabrik Aktiengesellschaft. Traversing device for winding machines. 3,664,596, Cl. 242-43.

Leonard, Regis J.; and Ulmer, Gene C., to Bethlehem Steel Corporation. Impregnated fired refractory shape and method of producing same. 3,664,853, Cl. 106-58.

Lerch, Ansgar: *See*—
Popelak, Alfred; Lerch, Ansgar; Stach, Kurt; Roesch, Egon; and Hardebeck, Klaus,3,665,002.

Lesar, Byron L. Package for light bulbs. 3,664,571, Cl. 229-39.

Lett, James E. System for constructing drain lines. 3,664,137, Cl. 61-11.

Leuck, Carl A.; and Schindelbeck, Fritz H., to Collins Radio Company. Reactor coil form. 3,665,358, Cl. 336-96.000

Leuck, Donald D.: *See*—
Budzynski, Leonard M.; and Leuck, Donald D.,3,665,401.

Leuck, Donald D., to Owens-Illinois, Inc. Switching circuits and method for diode elements in conductor selection matrices. 3,665,400, Cl. 340-166.

Leuthold, Peter, to U.S. Philips Corporation. Communication system comprising a matrix network of modulation elements. 3,665,314, Cl. 325-141.000

Lever Brothers Company: *See*—
Feenstra, Willem Hendrik; and Keppler, Johann Georg, 3,664,851.

Lewis, Martyn A.; and Domin, Siegfried, to SLI Industries, mesne. Variable mode feedback control system. 3,665,500, Cl. 318-596.

Leybold-Heraeus GmbH & Co.: *See*—
Samietz, Klaus P.; Wamser, Anton; and Weingartner, Ernst F., 3,665,084.

Lezan, Georges R. E.: *See*—
Keiles, Yoel; Kelley, Fred W., Jr.; and Lezan, Georges R. E.,3,665,293.

Libbey-Owens-Ford Company: *See*—
Montgomery, Eldwin C., 3,664,820.

Licentia Patent-Verwaltungs-G.m.b.H.: *See*—
Brune, Werner; Schwartz, Gunter; Dull, Ernst Hermann; and Polly, Edgar, 3,665,393.
Carl, Heinz, 3,664,876.

Lieckfeld, Werner, to Bran & Lubbe. Vertical cylindrical silo with wall of flexible material. 3,664,072, Cl. 52-63.

Liggett & Myers Incorporated: *See*—
Norman, Vello; and Williams, Thomas B., 3,664,352.

Lilley, Arthur E.: *See*—
Haroules, George G.; Brown, Wilfred E., III; Ewen, Harold I.; Lilley, Arthur E.; and Kodis, Ralph D.,3,665,467.

Lilly, Eli, and Company: *See*—
Tao, Eddie V. P., 3,665,042.

Linde A.G.: *See*—
Heyl, Walter, 3,664,128.

Linder, Joseph, to Fibre Glass-Evercoat Co., Inc. Dispensing container for plastic materials. 3,664,508, Cl. 222-386.000

Lindsey, Joseph W.; and Murphy, Larry O., to Bio-Logics, Inc. Respiration assembly and methods. 3,664,337, Cl. 128-194.000

Linnenbank, Charles D., to Baldt Anchor and Chain Corporation. Chain connecting link. 3,664,122, Cl. 59-85.

Linz, Peter Alois, to Moeller & Neumann GmbH. Drive for a roller bed mounted behind the cross- cut shears in a shearing line for metal plates. 3,664,662, Cl. 271-51.000

Lipp, James, to International Business Machines Corporation. Printing plate recording by direct exposure. 3,664,737, Cl. 355-18.000

Lirette, Odrey J. Pollution control and cooling device for exhaust systems. 3,664,135, Cl. 60-310.000

Lisochkin, Grigory Fedorovich: *See*—
Petrov, Gennady Nikolaevich; Lisochkin, Grigory Fedorovich; Shmagin, Valentin Parmenovich; and Shibanova, Olga Mikhailovna,3,664,989.

Liston, Max D., to Smith Kline Instruments, Inc. Log ratio circuit for double beam spectro- photometers. 3,664,744, Cl. 356-88.

Litton Systems, Inc.: *See*—
Sevc, John M.; and Pierce, Howard E., Jr., 3,664,016.

Liu, Shing-Gong, to United States of America, Atomic Energy Commission, mesne. Self-pulsed microwave oscillator. 3,665,339, Cl. 331-107.

Lloyd, William R. Portable gymnasium. 3,664,666, Cl. 272-58.000

Lockard, Joseph Larue; and Rose, William Henry, to AMP Incorporated. Thumbwheel switch with floatingly positioned actuator. 3,665,127, Cl. 200-11.0tw

Locke, James W., Sr.; and Goeller, John C., III, to Diamond Power Specialty Corporation. Fluid projection apparatus for cleaning heat exchangers. 3,664,310, Cl. 122-379.

Lockheed Aircraft Corporation: *See*—
Lahde, Reinhard N., 3,664,199.
McCarthy, William H.; Fenn, Raymond W., Jr.; and Crooks, Donald D., 3,664,889.
Southard, Charles V., 3,664,464.
Weber, Kenneth E.; Hoch, Geraldine H.; and Wanamaker, John L., 3,664,808.

Logan, Ted J., to Procter & Gamble Company, The. 2-Acetoxy-4-oxaalkanesulfonates, synthetic latices and method of preparing same. 3,664,983, Cl. 260-29.7sq

Lommers, Anthonius J.J.C.L.: *See*—
Roza, Engel; Benning, Herman J.G.M.; and Lommers, Anthonius J.J.C.L.,3,665,344.

Long, Alan Gibson: *See*—
Kennedy, James; Long, Alan Gibson; and Underwood, William G. E.,3,665,003.

Long, Cyril E. Two passenger cycle. 3,664,684, Cl. 280-231.000

Longnecker, Robert H., to Pacific Fast Mail. Model railroad electric locomotive sound system. 3,664,060, Cl. 46-232.

Lonza Ltd.: *See*—
Kugler, Tibor, 3,665,244.

Looney, Franklin S., Jr.: *See*—
Ibach, William F.; Looney, Franklin S., Jr.; and Reitz, David C.,3,664,381.

Loos, Kurt: *See*—
Heidrich, Klaus; Krewitt, Alfred; Loos, Kurt; and Pithan, Fritz,3,664,619.

Lopata, Herman, to Automatic Toll Systems, Inc. Coded security vault. 3,665,160, Cl. 235-61.1

Lorch, Hugh Olaf, to English Electric Company Limited, The. Rotary cryogenic machinery. 3,665,229, Cl. 310-52.

L'Oreal:*See*—
Kalopissis, Gregorire; and Abegg, Jean-Louis, 3,665,072.

Lorenz, Howard I.: *See*—
Rosser, Eugene P.; and Lorenz, Howard I.,3,664,442.

L'Organisation Economique Moderne:*See*—
Benichou, Marcel M., 3,664,051.

Loubeyre, Rene. Snow-goggles. 3,663,959, Cl. 2-14.

Loux, Harvey M., to Du Pont de Nemours and Company, E. I., and Company. Herbicidal 3-(substituted ureido)-crotonamides and crotonates. 3,664,823, Cl. 71-111.

Love, Wesley. Thermomagnetic device. 3,664,881, Cl. 136-205.000

Lovell, Clarence A.: *See*—
Fleming, James Evans; Lovell, Clarence A.; and Bandle, James M.,3,665,468.

Lovell, Thomas W.: *See*—
Bidwell, Dennis P.; Davies, Douglas R.; Hanley, John T., Jr.; Hart, William K.; Henderson, Thomas A.; Lovell, Thomas W.; and Fogg, Lloyd C.,3,665,447.

Loyzim, Robert J., to Superior Electric Company, The. Power supply for a stepping motor dependent upon voltage level and pulsing rate. 3,665,284, Cl. 318-696.

Lucas, Edward J.; and Lafrance, Jean C., to Avco Corporation. System for and method of levitating vehicles in a ground transportation system. 3,664,268, Cl. 104-148.

Lucas, Joseph, (Industries) Limited: *See*—
Bowcott, Roy Price, 3,665,233.
Channing, Derek, 3,664,319.
Cross, Dennis Rowland; and Stephens, Edward, 3,665,287.
Irons, Brian Pemberton Gyles, 3,664,693.
Ives, Andrew Peter, 3,665,384.
Matthews, Benjamin William, 3,665,094.
Wright, Maurice James, 3,665,501.

Lucien, Rene; and Masclet, Jean, to MEISSER. Disc brake cooling device. 3,664,467, Cl. 188-71.6

Ludlow Typograph Company: *See*—
Higgason, Frank G., Jr.; and Sehnert, Robert J., 3,664,577.

Luner, Stephen J.; and Kolin, Alexander, to University of California, Regents of the. Isoelectric focusing and fractionation of ampholytes in thermally engendered pH gradients. 3,664,939, Cl. 204-180.

Luras, Arne Widar. Drive means for an endless rope, especially for ski lifts. 3,664,205, Cl. 74-224.000

Lux-Optical: *See*—
Rivoire, Andre, 3,664,734.

Lynch, Frederick W.: *See*—
Simons, Gerald F.; Lynch, Frederick W.; and McKown, Gary C.,3,664,234.

Lynn, John R. Method for examination of visual fields. 3,664,732, Cl. 351-39.

Lyon, Wilfred W.: *See—*
Cahill, Bonaventure B.; and Lyon, Wilfred W.,3,665,199.

Lysenko, Vladimir Dmitrievich: *See—*
Graifer, Valery Isaakovich; Komarov, Alexandr Ivanovich; Lysenko, Vladimir Dmitrievich; Mingareev, Ravkhat Shagimardanovich; and Mukharsky, Enver Davydovich,3,664,418.

Macall, Thomas F., to Midland Capital Corporation, mesne. Solid state scanning system. 3,665,196, Cl. 250-83.3

Macaluso, Felix: *See—*
Beveridge, Robert W.; and Macaluso, Felix,3,665,164.

MacCreadie, William T. Starting-timing device for swimming, track and field. 3,665,452, Cl. 340-323.000

MacDaniel, Gene D., to Sweetheart Plastics, Inc. Insulated plastic bucket. 3,664,568, Cl. 229-1.5

MacDonald, John A.: *See—*
Harris, Robert B.; and MacDonald, John A.,3,665,338.

MacDonald, Robert Neal, to Du Pont de Nemours, E. I., and Company. 1,2,5-Thiadiazole polymers. 3,664,986, Cl. 260-78.

MacGuire, Andrew Edward. Method of manufacturing electric heating panels. 3,664,013, Cl. 29-611.

Machines Automatiques Modernes: *See—*
Hermieu, Max R. L., 3,664,752.

Machlett Laboratories, Incorporated: *See—*
Gordon, Jeffrey L., 3,665,247.

Machnacz, Joseph H. Page turner for sheet music and the like. 3,665,093, Cl. 84-487.000

Machon, Raymond; Flechet, Jean; and Hugo, Etienne. Composition for scouring natural silk and textile fibres. 3,664,805, Cl. 8-138.

Macielinski, Jerzy Witold, to GKN. Birfield Transmissions Limited. Constant velocity universal joints. 3,664,152, Cl. 64-8.000

Macione, Jack F.: *See—*
Palumbo, Nunzio J.; and Macione, Jack F.,3,664,276.

Mac Kenzie, Joseph H., Jr. Frame and wire termination block assembly. 3,665,377, Cl. 339-198.00g

Macovski, Albert, to Stanford Research Institute. Optical data processing system. 3,665,097, Cl. 178-6.000

Mac Phee, Kenneth E.: *See—*
Cohen, Margalit; and Mac Phee, Kenneth E.,3,664,974.

Macpherson, Anne Wilson: *See—*
Marshall, Alan; and Macpherson, Anne Wilson,3,665,073.

Madle, Peter J., to United States of America, Air Force. Flexible cable shielding. 3,665,096, Cl. 174-107.000

Maeda, Keisuke: *See—*
Kobayashi, Tatsuo; and Maeda, Keisuke,3,664,243.

Magee, Edward F.; and Haube, Stephen G., to Singer Company, The, mesne. Loran trainer. 3,665,086, Cl. 35-10.2

Magnusson, Kjell I.; and Owarfort, Rune T. Device for imparting a rotational as well as a longitudinal movement to tubes or rods. 3,664,531, Cl. 214-339.

Mahlman, Bert H., to Hercules Incorporated. Polyphase compositions and process for their preparation. 3,664,981, Cl. 260-27.

Mahlman, Bert H., to Hercules Incorporated. Polyphase propylene polymer-rubber compositions and process for their preparation. 3,665,059, Cl. 260-897.

Mahon, Roger F.: *See—*
Brunner, Richard; and Mahon, Roger F.,3,664,190.

Maillot, Jean-Paul, to International Standard Electric Corporation. Radiation counting tube of the Geiger-Muller type. 3,665,189, Cl. 250-83.6

Maiste, Arved; and Robertson, Melvin F., to White Motor Corporation of Canada Limited. Stone trap for a combine. 3,664,348, Cl. 130-27.0jt

Malafouris, Dannie O. Sheet metal fireplace. 3,664,325, Cl. 126-121.

Malies, Arthur M. Drapery master carrier. 3,663,988, Cl. 16-87.200

Mallory, P. R., & Co., Inc.: *See—*
Chestnut, Benjamin F.; and Stafford, Richard W., 3,664,198.
Puerner, George O., 3,665,137.
Sussingham, George J.; and Fagan, Franklin G., Jr., 3,665,178.

Malmstrom, Sven-Erik, to Forsheda Gummifabrik Aktiebolag. Seal between rotating-parts, movement of which is relative to each other. 3,664,675, Cl. 277-84.

Malone, Bernard: *See—*
Mawson, Desmond Leonard; and Malone, Bernard,3,664,406.

Malott, Richard C. Resistance locking cylinder. 3,664,236, Cl. 92-26.

Maltby, Frederick L., to Drexelbrook Controls, Inc. Capacitance-type monitoring apparatus. 3,665,301, Cl. 324-61.

Manasevit, Harold M., to North American Rockwell Corporation. Composite, method for growth of 11b-VIa compounds on substrates, and process for making composition for the compounds. 3,664,866, Cl. 117-201.000

Mancebo, Lloyd: *See—*
Gaines, Jerry L.; Ebert, Paul J.; Mancebo, Lloyd; and Cook, Frederick D.,3,665,236.

Mancini, Lloyd: *See—*
Thoms, William C.; and Mancini, Lloyd,3,665,375.

Mandel, Jorn: *See—*
Kraemer, Friedrich; Mandel, Jorn; Mayer, Siegfried; Rohrig, Klaus; Schulz, Hans-Peter; Weidenmuller, Hilmar; Haverkamp, Klaus Dieter; and Motz, Jurgen,3,664,826.

Mandrews, John Marshall, Jr., to Bell Telephone Laboratories, Incorporated. Control circuit for insulated gate field effect transistors. 3,665,218, Cl. 307-251.

Manecke, Siegfried E.: *See—*
Hild, Henry F.; Manecke, Siegfried E.; and Shaw, James L.,3,665,362.
Rosenberg, David M.; and Manecke, Siegfried E.,3,665,363.

Mangleburg, Charles S., to United States of America, Navy. Method and apparatus for the calibration of transducers. 3,664,176, Cl. 73-4.00r

Mansfield Sanitary, Inc.: *See—*
Drouhard, Alfred J., Jr.; and Stinson, Joseph B., 3,663,970.

Manville, George D. Dual arm attachment for drill press. 3,664,654, Cl. 269-9.000

Manzano, Alejandro C. Introduced in luminous publicity displays of continuous sash type. 3,664,050, Cl. 40-32.

Marbaix, Gaston E., Limited: *See—*
Hillier, Malcolm Edwin, 3,664,563.

Marbelite Company, Inc., The: *See—*
Siklos, Gregory, 3,665,382.

Marbet, Roman, to Hoffman-La Roche Inc.Process for the preparation of crystalline vitamin D_3. 3,665,020, Cl. 260-397.2

Marconi Company Limited, The: *See—*
Cresswell, Richard, 3,665,482.

Marcovitch, Jacob, to Rotary Profile Anstalt. Rolling articles. 3,663,977, Cl. 10-26.

Marengo, Giuseppe: *See—*
Lanza, Franco; and Marengo, Giuseppe,3,664,865.

Mares, Vladimir, to Ceskoslovensky uranovy prumysl oborovy podnik. Lifting prop for a transfer conveyor. 3,664,486, Cl. 198-126.

Marette, Ralph Thomas, to Hansen Manufacturing Company, The. Coupling mechanism. 3,664,375, Cl. 137-614.040

Marmonier, Monique Adele: *See—*
Meunier, Renee J. Louise; and Marmonier, Monique Adele,3,664,506.

Marshall, Alan; and Macpherson, Anne Wilson, to Geigy Chemical Corporation. Pharmaceuticals prepared from polycyclic bases and cation exchange resins. 3,665,073, Cl. 424-79.

Marshall, Alec Frank; and Taylor, Hugh Gordon, to Birmingham Small Arms Company Limited, The. Presses for production of complex components. 3,664,785, Cl. 425-78.

Marshall, Harold A. Fluid mixing device. 3,664,372, Cl. 137-552.000

Marshall Industries: *See—*
Cook, Richard L., 3,664,904.

Martin Marietta Corporation: *See—*
Keller, Joseph D.; and Osborne, Solomon C., 3,665,367.
Kuethe, Melvin W., 3,664,463.

Martin, Otis M.; Kough, John K.; Miller, Silas M.; and Kough, Blair B., to Ditz Crane. Blowback seal and gauge for building exterior panels. 3,664,081, Cl. 52-540.

Martin, Ronald L., to Honeywell Inc. Changeover apparatus for a condition responsive device. 3,664,580, Cl. 236-44.000

Martini, Karl; Forster, Peter; Bierbaum, Dieter; and Halm, Gunther, to Kombinat Veb Messgeratewerk Zwonitz. Coupling with thermoplastic and cellulosic friction disc. 3,664,472, Cl. 192-12.

Martrier, Jean, to Etat Francais. Apparatus for developing high fluid pressure. 3,664,801, Cl. 18-5.00h

Maruyama, Hideyo, to Bridgestone Tire Company Limited. Joint reinforced conveyor belt. 3,664,490, Cl. 198-193.000

Maruyama, Tsutomu: *See—*
Okamura, Seizo; Odan, Koji; and Maruyama, Tsutomu,3,664,861.

Maruzen Oil Company Limited: *See—*
Komatsu, Youji; Tamura, Takeshi; Fujii, Kinya; and Hatsutori, Masafumi, 3,665,034.

Marvin Glass & Associates: *See—*
Glass, Marvin I.; Breslow, Jeffrey D.; and Jaworski, Eugene, 3,664,670.

Maschinenfabrik Buckau R. Wolf Aktiengesellschaft: *See—*
Pause, Kurt, 3,664,151.

Maschinenfabrik Fahr A.G.: *See—*
Maugg, Josef, 3,664,106.

Maschinenfabrik Sack GmbH: *See—*
Sack, Ernst Theodor, 3,664,167.

Mascia, Carmen T., to Continental Can Company, Inc. Carrier and can opener combination. 3,664,496, Cl. 206-65.

Mascia, Carmen T., to Continental Can Company, Inc. Combined carrier and can opener. 3,664,497, Cl. 206-65.

Masclet, Jean: *See—*
Lucien, Rene; and Masclet, Jean,3,664,467.

Maselli, Matthew G., Jr. Method and apparatus for measuring and dispensing predetermined liquid volumes. 3,664,549, Cl. 222-64.

Maske, Bobby Charles, to American Cyanamid Company. Aqueous textile softening composition. 3,664,952, Cl. 252-8.75

Mason, Bertran W., Jr.: *See—*
Graffeo, Joseph Victor, Jr.; Mason, Bertran W., Jr.; and Wells, Wallace Ogden,3,664,948.

Massey-Ferguson G.m.b.H.: *See—*
Herbsthofer, Franz Joseph, 3,664,525.

Massey-Ferguson Industries Limited: *See—*
Thomas, Werner E., 3,664,720.

Mast Development Company: *See—*
Mast, Gifford M.; and Moeller, Lloyd E., 3,665,163.

Mast, Gifford M.; and Moeller, Lloyd E., to Mast Development Company. Drive and control means for educational devices such as card readers and the like. 3,665,163, Cl. 235-61.11d

Master Lock Company: *See—*
Foote, Daniel J., 3,664,163.

Mateja, Eugene V.: *See—*
Burm, George C.; Henriksen, Elmer C.; and Mateja, Eugene V.,3,665,446.
Matisa Materiel Industriel S.A.: *See—*
Sauterel, Gerard; and Fornerod, Andre, 3,664,265.
Matsumoto, Masanori: *See—*
Miyagawa, Takashi; Matsuo, Shunsuke; and Matsumoto, Masanori,3,665,166.
Matsuo, Shunsuke: *See—*
Miyagawa, Takashi; Matsuo, Shunsuke; and Matsumoto, Masanori,3,665,166.
Matsuoka, Seishiro: *See—*
Mizutani, Yukio; and Matsuoka, Seishiro,3,665,053.
Matsushita Denko Kabushiki Kaisha: *See—*
Kojima, Kiyoshi; and Abe, Toshiro, 3,665,340.
Matsushita Electric Industrial Co., Ltd.: *See—*
Hozumi, Shiro; and Kinugasa, Terukazu, 3,664,293.
Yamashita, Akio; and Yamada, Tadashi, 3,665,262.
Yano, Osahiko; Nakamura, Takahiro; and Yabu, Toshiomi, 3,665,098.
Yukami, Noboru; Otani, Hiroshi; and Kurokawa, Hideo, 3,665,264.
Mattel, Inc.: *See—*
Bass, Sidney; Clarke, Charles D.; and Morse, James E., 3,664,055.
Mattern, Harvey L.: *See—*
Orendorff, Maxwell C.; and Mattern, Harvey L.,3,664,515.
Matthews, Benjamin William, to Lucas, Joseph, (Industries) Limited. Fuse boxes for road vehicles. 3,665,094, Cl. 174-65.
Matthews, Dale M. Method and collector for extracting metals from an aqueous solution. 3,664,829, Cl. 75-108.
Mattis, Daniel C., to Yeshiva University. Optical shutter for laser or maser modulation. 3,664,726, Cl. 350-160.
Mattsson, Leif Erling M.; and Fredriksson, Karl Garry Kenneth, to Jonsereds Fabrikers Aktiebolag. Safety means for power-driven chain saws. 3,664,390, Cl. 143-32.
Matumoto, Tooru: *See—*
Watanabe, Kumao; Matumoto, Tooru; and Nakagawa, Tamio,3,663,974.
Maugg, Josef, to Maschinenfabrik Fahr A.G., mesne. Manipulating wheel for a hay or crop collecting turning or treating machine. 3,664,106, Cl. 56-370.
Maurer, John A.: *See—*
Buchtel, Dean H.; and Maurer, John A.,3,664,024.
Maurer, Werner. Magnetic chuck. 3,665,354, Cl. 335-295.
Maurice, Jean, to Societe Anonyme Francaise du Ferodo. Mechanically-operated disc-brake. 3,664,469, Cl. 188-72.9
Maurice, Jean, to Societe Francaise de l'Electro-Resistance. Fine-adjustment potentiometer. 3,665,364, Cl. 338-180.
Maurin, Jean: *See—*
Gislon, Andre; Weisang, Joseph-Edouard; and Maurin, Jean,3,665,047.
Mauro, Guy, to Transvac Electronics Corporation. Vending machine. 3,664,476, Cl. 194-58.
Mawson, Desmond Leonard; and Malone, Bernard, to Hooker Chemical Corporation. Mould making machines. 3,664,406, Cl. 164-161.
May, Eugene NOel, to J/B Industries, Inc. Pressure-responsive control device for electrical circuit. 3,665,132, Cl. 200-83.
Maybach, Richard Lee, to Bell Telephone Laboratories, Incorporated. Signal amplitude and phase homodyne. 3,665,304, Cl. 324-85.
Mayer, Siegfried: *See—*
Kraemer, Friedrich; Mandel, Jorn; Mayer, Siegfried; Rohrig, Klaus; Schulz, Hans-Peter; Weidenmuller, Hilmar; Haverkamp, Klaus Dieter; and Motz, Jurgen,3,664,826.
Maynen, James D.; and Bowden, George F., to Symons Mfg. Company. Having surface continuity and filler strips therefor. 3,664,630, Cl. 249-112.000
Mays, John C.: *See—*
Mays, William T.; and Mays, John C.,3,664,768.
Mays, William T.; and Mays, John C. Fluid transformer. 3,664,768, Cl. 417-197.000
Mazza, Lamberto, to Industrie A. Zanussi S.p.A. Household device for washing, smoothing and drying articles of apparel, underwear clothing and the like. 3,664,159, Cl. 68-205.
Mazzeo, Charles F.: *See—*
Haucke, Paul A.; Rosenfeld, Seymour; Schwab, Ronald W.; and Mazzeo, Charles F.,3,664,173.
Mc Cabe, John Stanton. Multiple-layer vessel with crack arresting welded joint. 3,664,379, Cl. 138-143.
McCabe, Leo J., to Mobil Oil Corporation. Dehydrocondensed poly(organo) silicones. 3,664,957, Cl. 252-49.600
McCain Manufacturing Corporation: *See—*
McCain, William B.; and Cosgrove, James F., 3,664,655.
McCain, William B.; and Cosgrove, James F., to McCain Manufacturing Corporation. Caliper system for signature machines. 3,664,655, Cl. 270-56.
McCarthy, Edward J. Push pull roller or stationary type exercising apparatus. 3,664,667, Cl. 272-83.
McCarthy, Roy Fred John: *See—*
Davies, Stuart Duncan; McCarthy, Roy Fred John; and Watts, Richard James,3,664,764.
McCarthy, William H.; Fenn, Raymond W., Jr.; and Crooks, Donald D., to Lockheed Aircraft Corporation. Ternary, quaternary and more complex alloys of Be-Al. 3,664,889, Cl. 148-11.50r
Mc Connell, John S. Vehicle door lock release method and apparatus. 3,664,211, Cl. 81-3.00r
McCorkle, David D., to Steredyne, Inc. Splicing tape feed mechanism. 3,664,903, Cl. 156-506.
McCoy, Michael R.; and Walther, Terry R., to Electronic Arrays, Inc. Integrated circuit, random access memory. 3,665,422, Cl. 340-173.
McCoy, Wallace W. Random honeycomb structure. 3,664,076, Cl. 52-264.
Mc Culloch, Thomas B., to Esso Production Research Company. Drilling on water and ice with a movable vessel. 3,664,437, Cl. 175-5.000
McDonald, Kent A.; and Cox, Roger G., to United States of America, Agriculture. Ultrasonic detection of lumber defects. 3,664,180, Cl. 73-67.600
McDonnell Douglas Corporation: *See—*
Edge, Andrew F.; and Hayase, Masashi, 3,665,138.
Sherman, Gale K., 3,664,598.
McDonough, Thomas B.: *See—*
Shaffer, John W.; and McDonough, Thomas B.,3,665,176.
McFalls, Richard J., to Cluett, Peabody & Co., Inc. Apparatus for making sleeve plackets. 3,664,283, Cl. 112-121.150
McFarland, Keith E.: *See—*
Becker, Carl H.; Dell, Harold R.; McFarland, Keith E.; and Wong, Herman,3,665,483.
McFee, James Hoffman: *See—*
Bergman, John George, Jr.; and McFee, James Hoffman,3,665,206.
McGlinchey, Hugh A.; and Nathans, Robert L. Electronic shoplifting prevention system. 3,665,448, Cl. 340-280.000
McGovern, Louis J.; West, Charles L.; and Webb, Orlando, to Stratford Engineering Corporation. Alkylation of dialkyl sulfate obtained from an overhead absorption phase. 3,665,050, Cl. 260-683.62
McGraw-Edison Company: *See—*
Larsen, Elmer L., 3,664,197.
Thompson, Richard D., 3,664,046.
McGregor, John Peter. Method of manufacturing a mating electrical connector. 3,664,018, Cl. 29-629.000
McIlhinney, Allan E.: *See—*
Capes, Charles E.; McIlhinney, Allan E.; and Coleman, Richard D.,3,665,066.
McIntosh, Bruce C., to General Electric Company. Non-time indicating number correction circuit. 3,664,117, Cl. 58-35.00w
McIntosh, Bruce Cromwell: *See—*
Emerson, Paul Gene; Thamhain, Hans Jurgen; and McIntosh, Bruce Cromwell,3,664,116.
McIntosh, Harold A., to Robertshaw Controls Company. Armature control system. 3,665,258, Cl. 317-132.
McIntosh, Michael D., to Landis Tool Company, mesne. Control system for a machine tool. 3,665,279, Cl. 318-571.
McKnight, Robert A., to Singer Company, The, mesne. Head positioning device. 3,664,746, Cl. 356-138.
McKown, Gary C.: *See—*
Simons, Gerald F.; Lynch, Frederick W.; and McKown, Gary C.,3,664,234.
McLafferty, George H., to United Aircraft Corporation. Laser device. 3,665,336, Cl. 331-94.500
Mc Leman, Alexander D., to British Steel Corporation. Apparatus for detecting objects. 3,665,202, Cl. 250-237.00r
McLeod, David P. J.; and Gretzky, Anthony J., to Brunswick Corporation. Lane resurfacer. 3,664,393, Cl. 144-117.
Mc Lintic, William James, to British Lighting Industries Limited. Lighting system. 3,665,179, Cl. 240-41.300
McMenamin, James M., to Teeg Research, Inc. Fire detector utilizing ultraviolet and infrared sensors. 3,665,440, Cl. 340-228.2
McMillin, Grant L., Jr., to Webster Electric Company, Inc. Tape recorder brake assembly. 3,664,609, Cl. 242-204.
McNair, Waldo D. Mower construction. 3,664,103, Cl. 56-298.000
McNally, John S.: *See—*
Hatton, John A., Jr.; and McNally, John S.,3,665,055.
Mc Pherson, Donald F., to Xerox Corporation. Paper cassette loading device. 3,664,663, Cl. 271-61.
Meadus, Frederick W.; Puddington, Ira E.; and Okvist, Nils Axel Gunnar, to Canadian Patents and Development Limited. Agglomerated metal shot. 3,664,824, Cl. 75-0.50r
Means, William A., to Applied Motors, Inc. Energy conserving voltage converter. 3,665,502, Cl. 321-28.
Mechanic, Bernard I., to Tiara Corporation. Pantograph machine movement control assembly. 3,664,230, Cl. 90-13.100
Meckley, George E., to Hanover Guest Quality Foods Corporation. Apparatus for handling articles. 3,664,084, Cl. 53-59.
Medovar, Boris Izrailevich; Latash, Jury Vadimovich; Bondarenko, Oleg Petrovich; and Bogachenko, Alexsey Georgievich. Remelting system and process utilizing varying voltage, current and melting rate. 3,665,080, Cl. 13-9.
Medovar, Boris Izrailevich: *See—*
Paton, Boris Evgenievich; Lebedev, Vladimir Konstantinovich; Medovar, Boris Izrailevich; Pentegov, Igor Vladimirovich; Latash, Jury Vadimovich; Bondarenko, Oleg Petrovich; Baglai, Vitaly Mikhailovich; Podola, Nikolai Vasilievich; and Emelyanenko, July Georgievich,3,665,081.
Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Bondarenko, Oleg Petrovich; Latash, Jury Vadimovich; Baglai, Vitaly Mikhailovich; and Shirshov, Vladimir Grigorievich,3,665,488.
Meese, Heinz Gunter: *See—*
Dietrich, Hermann; Schuler, Karl; and Meese, Heinz Gunter,3,665,352.

Meilander, Willard C., to Goodyear Aerospace Corporation. Method and apparatus for high speed vehicle position acquisition. 3,665,464, Cl. 343-6.5

MEISSER: *See—*
Lucien, Rene; and Masclet, Jean, 3,664,467.

Mejia, Salvador, to Industrias Sigma, S.A. Electrical welding machine having amperage control transformer. 3,665,150, Cl. 219-131.

Memorex Corporation: *See—*
Applequist, Roy A.; and Wilson, Laurence M., 3,665,434.

Mendelson, Ralph A.: *See—*
Kirkpatrick, Milton E.; and Mendelson, Ralph A.,3,665,260.

Meneret, Jean, to Commissariat a l'Energie Atomique et Societe Desmarquest SA. Device for initiating an exothermic reaction. 3,664,651, Cl. 266-1.

Menicanti, Adriano; and Oberto, Giacomo, to Olivetti, Ing., C., & C., S.p.A. Mutual locking device for an office machine with electric keyboard. 3,664,478, Cl. 197-17.000

Menyailo, Anatoly Tikhonovich; Pospelov, Mikhail Valerievich; Kaliko, Olga Romanovna; Pokrovskaya, Inna Evgenievna; Fedorova, Valentine Vsevolodovna; Shilnikova, Albina Georgievna; Yakovleva, Antonina Karpovna; and Narozhenko, Tamara Georgievna. Process for ozonizing unsaturated compounds to form alkali earth metal peroxide, aliphatic aldehydes and aliphatic ketones. 3,664,810, Cl. 23-187.

Merck & Co., Inc.: *See—*
Grabner, Roy W.; Zimmerrman, Morris; Subjack, William J.; and Veber, Daniel F., 3,664,926.

Mergens, Gerald R., to Reynolds Guyer, Inc. Shipping and display containers. 3,664,494, Cl. 206-44.

Merges, John C., Jr.: *See—*
Duling, Irl N.; and Merges, John C., Jr.,3,665,068.

Merkin, Billie C., to Aluminum Company of America. Sill anchoring structure. 3,664,078, Cl. 52-293.

Merlino, Eugene L., Jr.: *See—*
Dreimanis, Herbert V.; Spisz, Albert S.; Merlino, Eugene L., Jr.; and Ellis, Jonas,3,664,481.

Merrill, Richard C.: *See—*
Wright, Archibald N.; and Merrill, Richard C.,3,664,899.
Wright, Archibald N.; and Merrill, Richard C.,3,665,269.

Merriman, Inc.: *See—*
Wayson, Andrew J., 3,664,113.

Messer Griesheim GmbH: *See—*
Schobel, Karl; and Becker, Werner, 3,665,147.

Messina, Joseph F.; and Gisser, Henry, to United States of America, Army. Grease compositions. 3,664,956, Cl. 252-49.600

Messina, Joseph F.; and Gisser, Henry, to United States of America, Army. Grease compositions. 3,664,958, Cl. 252-54.6

Messrs. Kabushiki Kaisha Mitachi Onkyo Seisakusho: *See—*
Ikeda, Kazuhiro, 3,665,123.

Mesta Machine Company: *See—*
Petros, Andrew J.; and Rybar, Clement S., 3,664,518.

Meszaros, Daniel. Master shoe last with changeable toe tip portion. 3,663,978, Cl. 12-133.00b

Mette, Herbert B., to Questor Corporation. Sealing construction. 3,664,535, Cl. 215-11.

Metzger, Lenard M., to Eastman Kodak Company. Digital encoding apparatus for the synchronization of separate pictures and sound records. 3,664,735, Cl. 352-24.000

Metzger, Leopold H.; and Miller, Harold C., to Super-Cut, Inc. Rotary grinding wheel. 3,664,068, Cl. 51-209.

Metzger, Reinhold, to VDO Tachometer Werke Adolf Schindling GmbH. Apparatus for the transmission of a rotary movement through the wall of a chamber under pressure. 3,664,202, Cl. 74-18.1

Meunier, Renee J. Louise; and Marmonier, Monique Adele, to Sertna, Societe d'Etudes et de Recherches de Techniques Nouvelles Appliquees S.A. Apparatus for purifying blood. 3,664,506, Cl. 210-282.000

Meyer, Alfred E., to Anetsberger Brothers, Inc. Production broiler with hanging food holders. 3,664,257, Cl. 99-427.

Meyers, Robert E., to Bendix Corporation, The. Hydraulic brake pressure limiting device. 3,664,130, Cl. 60-54.5

Miavecz, Joseph L.: *See—*
Schmersal, Larry J.; Miavecz, Joseph L.; Pierce, Edward W.; and Wojcik, David S.,3,665,455.

Michaels, Leonard H., to Harper-Wyman Company. Oven control valve and system. 3,664,323, Cl. 126-42.000

Michiuchi, Masayuki, to Honda Giken Kogyo Kabushiki Kaisha. Apparatus for attaching a steering handle to a two-wheel vehicle. 3,664,209, Cl. 74-551.300

Michnik, Lewis; and Tapply, William G., to Sierra Research Corporation. System for passing on-frequency signals and for gating-out off-frequency signals. 3,665,321, Cl. 325-478.000

Microdot, Inc.: *See—*
Speransky, Jaroslav; and Cerny, Harry E., 3,665,232.

Micromation Systems Inc.: *See—*
Somervell, James A., 3,665,420.

Midland Capital Corporation: *See—*
Macall, Thomas F., 3,665,196.

Mike-Master, Inc.: *See—*
Oskar, John Raymond, 3,665,490.

Mikumo, Masatoshi: *See—*
Tanaka, Atsushi; Kobayashi, Hiroomi; Kudo, Teizo; and Mikumo, Masatoshi,3,665,057.

Milchem Incorporated: *See—*
Rice, Herbert L.; Cizek, Arthur; and Thaemar, Marvin O., 3,665,035.

Miller, Albert T., to Devro, Inc. Edible collagen film. 3,664,844, Cl. 99-18.

Miller, Donald J.; and Schmidlin, Raymond J., to Addressograph Multigraph Corporation. Master sheet retainer for printing machines. 3,664,260, Cl. 101-132.

Miller, Frederick O., to Miller Mold Company. Molding of threaded caps. 3,664,800, Cl. 425-391.

Miller, Harold C.: *See—*
Metzger, Leopold H.; and Miller, Harold C.,3,664,068.

Miller, Howard A., to Eastman Kodak Company. Xerographic development apparatus and process. 3,664,857, Cl. 117-17.5

Miller, Howard S.; and Shooman, William, to Sanders Associates, Inc. Signal translator. 3,665,409, Cl. 340-172.500

Miller, Justin G., deceased (by Miller, Rita Ann; administratrix), to Lear Siegler, Inc. Deceleration schedule for aircraft landing. 3,665,465, Cl. 343-7.

Miller, Lloyd E., Jr. Thermo-compensating valve lifter for internal combustion engines. 3,664,312, Cl. 123-90.190

Miller, Lowell E.: *See—*
Henderson, Robert M.; Zechlin, Richard; and Miller, Lowell E.,3,665,169.

Miller, Marie E.: *See—*
Hammond, Arthur W.; and Miller, Marie E.,3,664,020.

Miller Mold Company: *See—*
Miller, Frederick O., 3,664,800.

Miller, Norman C., to North American Rockwell Corporation. Mechanical mounting for a thermoelectric couple. 3,664,880, Cl. 136-205.000

Miller, Rita Ann: *See—*
Miller, Justin G.,3,665,465.

Miller, Samuel E., to Quick Service Textiles, Inc. Waist band assembly. 3,663,963, Cl. 2-237.

Miller, Silas M.: *See—*
Martin, Otis M.; Kough, John K.; Miller, Silas M.; and Kough, Blair B.,3,664,081.

Miller, Willard Wallace: *See—*
White, Arnold George; Smith, Thomas Edward; Work, Lyall Campbell; and Miller, Willard Wallace,3,664,929.

Mills, Albert D.; and Ruhland, Walter F., to Continental Machines, Inc. Variable volume vane pump. 3,664,776, Cl. 418-16.000

Mills Products, Inc.: *See—*
Mills, Vernon I., 3,664,326.

Mills, Vernon I., to Mills Products, Inc. Safety screen for oven windows. 3,664,326, Cl. 126-200.

Minagawa, Tatsuzo. Pushbutton type mechanical pencil. 3,664,753, Cl. 401-65.000

Minbiole, Louis J., Jr.; Clark, Chester G.; and Neumann, John W., to Udylite Corporation, The. Apparatus for processing workpieces. 3,664,354, Cl. 134-61.

Minchey, Jerry M.; and Ramsey, Willard A. Pneumatic control mechanism for looms and the like. 3,664,383, Cl. 139-317.

Miner, Jesse H.: *See—*
Boswell, John E. E., Jr.; and Miner, Jesse H.,3,664,036.

Mingareev, Ravkhat Shagimardanovich: *See—*
Graifer, Valery Isaakovich; Komarov, Alexandr Ivanovich; Lysenko, Vladimir Dmitrievich; Mingareev, Ravkhat Shagimardanovich; and Mukharsky, Enver Davydovich,3,664,418.

Minicars, Inc.: *See—*
Di Napoli, Nicholas; Friedman, Donald; Nicholls, Robin P.; Wilcox, Howard A.; and Wood, Charles E., 3,665,397.

Ministry of International Trade and Industry: *See—*
Kawai, Hidetoshi; Iizuka, Hajime; Shinkai, Takuo; and Yoshioka, Yoshiro, 3,665,398.

Minnesota Mining and Manufacturing Company: *See—*
Elder, James T.; and Wright, Donald A., 3,665,449.
Goff, Robert F.; and Smith, David P., 3,665,182.
Goff, Robert F., 3,665,185.
Harrington, Thomas L.; and Jorgensen, Jens L., 3,664,242.
Huffman, William A., 3,664,858.
Olyphant, Murray, Jr.; Cartier, Michael David; and Freeman, Charles Robert, 3,665,428.

Mino, Shinziro: *See—*
Ohsawa, Mitsuo; and Mino, Shinziro,3,665,320.

Minolta Camera Kabushiki Kaisha: *See—*
Kobayashi, Tatsuo; and Maeda, Keisuke, 3,664,243.
Kuramoto, Yoshio; and Inagaki, Shotaro, 3,664,246.
Tanaka, Susumu, 3,664,833.

Minshull, Robert: *See—*
Fitzmaurice, Colin; and Minshull, Robert,3,665,013.

Mio Marine Corporation: *See—*
Rabideau, Gerald T., 3,664,285.

Miracle Hub and Wheel, Inc.: *See—*
Leach, Raymond B., 3,664,710.

Mitchell, James H.; and Mueggenburg, Hans H., to United States of America, Air Force. Platelet injector. 3,664,588, Cl. 239-418.000

Mitsubishi Denki Kabushiki Kaisha: *See—*
Dhno, Eiichi; and Akamatsu, Masahiko, 3,665,286.

Mitsubishi Edogawa Kagaku Kabushiki Kaisha: *See—*
Yoshikawa, Yoshio; Kondo, Hiroshi; Sugio, Akitoshi; and Kato, Tomotake, 3,664,035.

Mitsubishi Electric Corporation: *See—*
Kurahashi, Koichiro; and Ikebata, Shigeki, 3,665,246.
Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
Fujii, Masaru; Sagara, Kazuo; and Isomura, Shuichi, 3,665,276.
Hirota, Nobuyoshi; and Onoshima, Yoshio, 3,664,965.
Ujiie, Akira, 3,665,143.
Mitsugi, Takashi: *See—*
Kondo, Eiji; and Mitsugi, Takashi,3,665,022.
Miyagawa, Takashi; Matsuo, Shunsuke; and Matsumoto, Masanori, to Omron Tateisi Electronics Co. Electrical counter. 3,665,166, Cl. 235-92.
Miyawaki, Sentaro. Steam trap. 3,664,363, Cl. 137-183.
Mizutani, Yukio; and Matsuoka, Seishiro, to Tokuyama Soda Kabushiki Kaisha. Process for preparing polymers from ethylenically unsaturated glycidyl monomers. 3,665,053, Cl. 260-836.
M&J Valve Company: *See—*
Grove, Marvin H.; and Van Arsdale, Lyle R., 3,664,356.
Mobil Oil Corporation: *See—*
Bridger, Robert F., 3,665,038.
McCabe, Leo J., 3,664,957.
Mobile Drilling Company, Inc.: *See—*
Henson, William P., 3,664,444.
Moeller & Neumann GmbH: *See—*
Linz, Peter Alois, 3,664,662.
Moeller, Lloyd E.: *See—*
Mast, Gifford M.; and Moeller, Lloyd E.,3,665,163.
Mohl, Wilhelm; and Kruger, Heinz, to FA Otto Thamert, Textil-u. Kunstastoff GmbH & Co., KG. Artificial breast. 3,663,968, Cl. 3-36.000
Moline, Elmer Ray. Cushion hitch for vehicle bumpers. 3,664,685, Cl. 280-486.000
Momany, Ned K., to Winner Boats. Grillage for a boat. 3,663,976, Cl. 9-6.
Moncher, Frank L.: *See—*
Riordan, Hugh E.; and Moncher, Frank L.,3,664,713.
Monek, James J.: *See—*
Rehhausser, Frederick V.; Earnest, Elmer Dean; Bock, Robert V.; Gerbstadt, Frederick H.; and Monek, James J.,3,665,421.
Moniz, William B.: *See—*
Britt, A. D.; and Moniz, William B.,3,664,985.
Monsanto Company: *See—*
Bergomi, Joseph G., Jr.; Dill, Dale R.; and Graham, Paul R., 3,665,060.
Kerst, Al F., 3,664,975.
Speziale, Angelo; and Smith, Lowell R., 3,665,023.
Montagne, Jean B., to Compagnie Generale des Etablissements Michelin raison sociale Michelin & Cie. Tread for heavy-duty radial-carcass tire. 3,664,402, Cl. 152-209.000
Montecatini Edison S.p.A.: *See—*
Sianesi, Dario; and Fontanelli, Renzo, 3,665,041.
Montgomery, Eldwin C., to Libbey-Owens-Ford Company. Movable restrictor tiles in float glass apparatus and method of regulating glass ribbon. 3,664,820, Cl. 65-99.
Montgomery, Harold S.: *See—*
Budnik, Roger J.; Montgomery, Harold S.; and Nutting, David J.,3,664,037.
Montgomery, Harold S.; and Nutting, David J., to Nutting Industries, Ltd. Projection apparatus for sequential timed presentation of individual frames. 3,664,562, Cl. 226-76.
Montgomery, Sam R.: *See—*
Cottrell, Samuel H.; and Montgomery, Sam R.,3,664,453.
Moody, Norman Frank, to Canadian Patents and Development Limited. Filter for compensating efficiency differences in an optical system. 3,665,191, Cl. 250-86.
Moore, George W., Inc.: *See—*
Moore, Harrington, 3,664,400.
Moore, Harrington, to Moore, George W., Inc. Locking set screw. 3,664,400, Cl. 151-22.
Moore, Robert B., Jr.: *See—*
Ammons, Robert L.; and Moore, Robert B., Jr.,3,664,114.
Moore, Willis D. Automatically adjustable rear view mirror. 3,664,729, Cl. 350-281.
Morgan, Loran B. Scleral lens with attached tube. 3,664,340, Cl. 128-249.
Morin, Joseph Cecil, to Application Engineering Corporation. Method and apparatus for mixing particulate solids. 3,664,640, Cl. 259-8.
Morin, Joseph Cecil, to Application Engineering Corporation. Mixing apparatus. 3,664,641, Cl. 259-8.
Morin, Joseph Cecil, to Application Engineering Corporation. Mixing apparatus. 3,664,642, Cl. 259-8.
Morinaud, Pierre C., to Tektronix, Inc. Electrical lead-in tubular socket member for electronic tubes. 3,665,239, Cl. 313-318.
Morine, Reuben H. Irrigation pipe transfer apparatus. 3,664,002, Cl. 29-200.00d
Morita, Tadao: *See—*
Yamamoto, Mititaka; Kawahara, Kazuhiro; and Morita, Tadao,3,665,162.
Morrill, Ralph C. Aquarium. 3,664,301, Cl. 119-5.
Morris, John C.: *See—*
Noller, Harry F.; and Morris, John C.,3,664,578.
Morris, Thomas B.; Paul, Fred; and Powell, Barney R., said Powell assor. to Standard Forge and Axle Company, Incorporated. Apparatus for welding brake shoes. 3,665,146, Cl. 219-124.
Morrison, Albert R.; and Haynes, Harold L., to Owens-Corning Fiberglas Corporation. Size for fibers and glass fibers coated therewith. 3,664,855, Cl. 106-212.
Morrison, John A.: *See—*
Flournoy, Norman E.; Morrison, John A.; Dancy, Julian H.; and Trippet, Raymond,3,664,804.
Morrow, John Phillip, to Bell Telephone Laboratories, Incorporated. Nonrecursive digital filter apparatus employing delayed-add configuration. 3,665,171, Cl. 235-152.000
Morse, James E.: *See—*
Bass, Sidney; Clarke, Charles D.; and Morse, James E.,3,664,055.
Morstadt, Richard A.: *See—*
Kopec, Thomas J.; and Morstadt, Richard A.,3,665,107.
Morton-Norwich Products, Inc.: *See—*
Burch, Homer A.; and Schwan, Thomas J., 3,665,032.
Harris, Nicholas D., 3,665,005.
Moslo, Ernest P. Parison-type bottle blowing machine. 3,664,798, Cl. 425-326.
Motor Industry Research Association: *See—*
Searle, John Albert; and Perrin, Dennis William, 3,664,038.
Motoren- und Turbinen-Union Muenchen G.m.b.H.: *See—*
Fehler, Adolf, 3,664,124.
Motorola, Inc.: *See—*
Davis, William F.; and Frederiksen, Thomas M., 3,665,329.
Drozdowicz, Kenneth Paul; Fowler, William Rey; and Averkiou, George, 3,665,266.
Frazee, Orville Phillip, 3,664,893.
Reed, L. J., 3,665,342.
Thompson, James Elbert, 3,665,343.
Mott, James: *See—*
Zehr, Richard M.; Mott, James; and Schlimgen, Lawrence,3,665,399.
Mottin, Ralph E.: *See—*
Graham, Richard J.; Mottin, Ralph E.; and Noren, Oscar B.,3,664,495.
Motz, Jurgen: *See—*
Kraemer, Friedrich; Mandel, Jorn; Mayer, Siegfried; Rohrig, Klaus; Schulz, Hans-Peter; Weidenmuller, Hilmar; Haverkamp, Klaus Dieter; and Motz, Jurgen,3,664,826.
Moulinage et Retorderie de Chavanoz: *See—*
Seguin, Pierre, 3,665,095.
Mounier, Bruce. Impact actuated underwater gun. 3,664,052, Cl. 42-1.00l
Moyer, Richard E. Mushroom slicer. 3,664,398, Cl. 146-129.00r
Moyer, Ronald C.; and Uffner, Melville W., to Air Products and Chemicals, Inc. Functional surface coating compositions for cellulosic material. 3,664,987, Cl. 260-78.5
Moyle, Henry Dinwoodey, Jr.; and Bates, William. Cancer test specimen gathering device. 3,664,328, Cl. 128-2.
M. S. Churchman Inc.: *See—*
Sterns, Lorance E.; and Howard, Arthur G., 3,664,458.
M&T Chemicals Inc.: *See—*
Wowk, Anatole, 3,665,025.
Mueggenburg, Hans H.: *See—*
Mitchell, James H.; and Mueggenburg, Hans H.,3,664,588.
Mueller, Francis E., to International Business Machines Corporation. Method for aligning magnetic heads for use in recording a master disk pack. 3,665,437, Cl. 340-174.10c
Mueller, Peter F., to Technical Operations, Incorporated. Optical processing of information including synthesis by complex amplitude addition of diffraction spectra. 3,664,248, Cl. 95-12.2
Mukharsky, Enver Davydovich: *See—*
Graifer, Valery Isaakovich; Komarov, Alexandr Ivanovich; Lysenko, Vladimir Dmitrievich; Mingareev, Ravkhat Shagimardanovich; and Mukharsky, Enver Davydovich,3,664,418.
Mulkey, Owen R.; Kleingartner, Charles A.; and Zoutte, Arnold A., to Boering Company, The. Capacitor ladder network. 3,665,458, Cl. 340-347.0da
Muller, Peter: *See—*
Gnagi, Alex; and Muller, Peter,3,665,461.
Mullersman, Ferdinand H.; and Rockey, Robert E., to General Electric Company. Polarity-mated rechargeable battery and charging unit. 3,665,285, Cl. 320-2.
Munguet, Oscar Ferrer. Fluid pressure regulating device. 3,664,366, Cl. 137-209.
Muniz, Eloy Fernando. Washboard. 3,664,160, Cl. 68-224.000
Munk, Edmund: *See—*
Haas, Herbert G.; Munk, Edmund; and Fink, Alfred,3,665,065.
Murakami, Junzo; Asakawa, Shigeo; and Takeuchi, Kenji, to Tokyo Shibaura Electric Co., Ltd. Decoding system. 3,665,460, Cl. 340-347.0da
Murakami, Masuo; Iwanami, Masaru; Kubo, Kazuo; Sano, Kenji; Kochiya, Masahiro; and Arima, Hideki, to Yamanouchi Pharmaceutical Co., Ltd. 4-Methylcyclohexylhydroxy amine. 3,665,037, Cl. 260-563.
Murdock, Forrest L., Sr. Separator vessel having multiple parallel separator plates. 3,664,093, Cl. 55-174.
Murfree, James A., Jr.: *See—*
Hubbuch, Theodore; Murfree, James A., Jr.; Duncan, William A.; Sandlin, Billy J.; and Nappier, Henry A.,3,664,969.
Murphy, G. W., Industries, Inc.: *See—*
Jacyno, Anthony, 3,665,228.
Murphy, Larry O.: *See—*
Lindsey, Joseph W.; and Murphy, Larry O.,3,664,337.

Murray, Dudley Stuart. Apparatus for the production of tubing. 3,664,783, Cl. 425-71.

Murray, Joseph John; and Pear, Charles B., Jr., to Potter Instrument Company, Inc. Long-wearing magnetic head. 3,665,436, Cl. 340-174.10f

Murray, Robert L.: *See—*
Guertin, Robert W.; and Murray, Robert L.,3,664,634.

Nabs Leasing Corporation: *See—*
Shulman, Arthur; and Bonis, Henry M., Jr., 3,664,281.

Nagano, Kentaro: *See—*
Ishimatsu, Tsuyoshi; Ito, Takashi; Yano, Masamitsu; Takeda, Hajime; and Nagano, Kentaro,3,664,765.

Nakagawa, Koji: *See—*
Seko, Maomi; Yomiyama, Agira; Takahashi, Yasunobu; Seta, Shigetoshi; and Nakagawa, Koji,3,664,936.

Nakagawa, Tamio: *See—*
Watanabe, Kumao; Matumoto, Tooru; and Nakagawa, Tamio,3,663,974.

Nakakita Seisakusho Company Limited: *See—*
Kosugi, Takeshi; and Kunimitsu, Toshio, 3,664,358.

Nakamura, Takahiro: *See—*
Yano, Osahiko; Nakamura, Takahiro; and Yabu, Toshiomi,3,665,098.

Nakamura, Tomomi. Pipe joints. 3,664,691, Cl. 285-112.

Nakanishi, Atsuo; Izawa, Shinichi; and Sato, Mikio, to Asahi Dow Limited. Bulk polymerized aromatic hydrocarbon in rubber and polyphenylene ether. 3,664,977, Cl. 260-4.0ar

Nakanuma, Sho; Tsujide, Tohru; Wada, Toshio; Igarashi, Ryo; and Onoda, Katsuhiro, to Nippon Electric Company, Ltd. Memory matrix using MIS semiconductor element. 3,665,423, Cl. 340-173.

Nakaya, Naohisa, to Iwatsu Electric Co., Ltd. Trigger controlling method. 3,665,324, Cl. 328-63.

Nalco Chemical Company: *See—*
Oberhofer, Alfred W.; Anderson, Donald R.; and Payne, Charles C., 3,664,870.

Nalpka, Raymond: *See—*
Deradorian, Bagdasar; Svenson, James; and Nalpka, Raymond,3,665,497.

Napier, Jeff W.Child's vehicle-simulating collapsible playpen. 3,664,664, Cl. 272-1.00c

Nappier, Henry A.: *See—*
Hubbuch, Theodore; Murfree, James A., Jr.; Duncan, William A.; Sandlin, Billy J.; and Nappier, Henry A.,3,664,969.

Narayan, Subrahmanyam Yegna: *See—*
Collard, Jacques Roger; Narayan, Subrahmanyam Yegna; and Paczkowski, John Paul,3,665,254.

Narayanan, Venkatachala Lakshmi: *See—*
Haugwitz, Rudiger D.; and Narayanan, Venkatachala Lakshmi,3,665,007.

Narozhenko, Tamara Georgievna: *See—*
Menyailo, Anatoly Tikhonovich; Pospelov, Mikhail Valerievich; Kaliko, Olga Romanovna; Pokrovskaya, Inna Evgenievna; Fedorova, Valentine Vsevolodovna; Shilnikova, Albina Georgievna; Yakovleva, Antonina Karpovna; and Narozhenko, Tamara Georgievna,3,664,810.

Nash, Franklin Richard: *See—*
Bridenbaugh, Paul Michael; Carruthers, John Robert; and Nash, Franklin Richard,3,665,205.

Nashua Corporation: *See—*
Leclair, Albert W., 3,664,842.

Nathans, Robert L.: *See—*
McGlinchey, Hugh A.; and Nathans, Robert L.,3,665,448.

National Cash Register Company, The: *See—*
Weeks, Horace W.; and Frazier, John R., 3,664,661.

National Forge Company: *See—*
Witkin, Donald E., 3,664,540.

National Research Development Corporation: *See—*
Lees, Alexander; Richards, John Charles Shenstone; and Jason, Alfred Charles, 3,665,302.
Quayle, Joshua Creer; Greatrix, Graham Roland; and Coombe, Ronald Alan, 3,664,306.
Stein, Stephen, 3,665,187.
Wood, James David London Hedley, 3,664,960.

Navigation Computer Corporation: *See—*
Peroni, Peter A.; and Jones, John Paul, Jr., 3,664,014.

Naylor, Richard Norman, to Concept, Inc. Nerve locator/stimulator. 3,664,329, Cl. 128-2.1

Nederlandse Centrale Organisatie voor Toegepast- Natuurwetenschappelijk Onderzoek: *See—*
Fontijn, Leendert Antonius, 3,664,843.

Nederlandse Maatschappij voor Werken Buitengaats (Netherlands Offshore Company) N.V.: *See—*
Jansz, Joost Werner, 3,664,142.

Neff, Samuel G. Golf club head protector. 3,664,399, Cl. 150-1.50r

Negishi, Satoshi, to Tokyo Shibaura Electric Co., Ltd. Automatic processing system for bowling games. 3,665,407, Cl. 340-172.500

Neil, Hugh G.: *See—*
Dabbs, Clyde Harwell; and Neil, Hugh G.,3,664,345.

Nelson, Donald Frederick, to Bell Telephone Laboratories, Incorporated. Acousto-optic tuning of optical second harmonic generators and other parametric devices. 3,665,204, Cl. 307-88.3

Nelson, Dorsey C.: *See—*
Fairbanks, Theodore H.; Gillespie, Robert F.; and Nelson, Dorsey C.,3,664,780.

Nerwin, Hubert, to Eastman Kodak Company. Film cartridge. 3,664,595, Cl. 242-71.100

Netti, Anthony; and Bussiere, Douglas, to Davis & Furber Machine Company. Rotating spinning ring. 3,664,112, Cl. 57-120.

Neumann, John W.: *See—*
Minbiole, Louis J., Jr.; Clark, Chester G.; and Neumann, John W.,3,664,354.

Neutron Products Inc.: *See—*
Ransohoff, Jackson A., 3,665,183.

Nevin, John B., to Phillips Petroleum Corporation. Adjustable air gap in liquid quenching of melt- spun filaments. 3,664,782, Cl. 425-71.

New Nippon Electric Company Ltd.: *See—*
Kaneda, Isao; and Takeuchi, Kiyokazu, 3,665,243.

Nexus Limited: *See—*
Sykes, Christopher; and Denroche, Charles H. P., 3,664,627.

Neyrpic-BMB: *See—*
Lejeune, Pierre, 3,664,096.

Ng, David M.; and Rehkopf, Charles H., to GTE Sylvania Incorporated. Means for achieving a controlled gradient density coating on a light attenuation medium. 3,664,295, Cl. 118-8.

Nicholas, Peter G.: *See—*
Buswell, Richard F.; Nicholas, Peter G.; and Olsson, William J.,3,664,873.

Nicholls, Robin P.: *See—*
Di Napoli, Nicholas; Friedman, Donald; Nicholls, Robin P.; Wilcox, Howard A.; and Wood, Charles E.,3,665,397.

Nichols, George E., Jr., to Bird Machine Company. Slurry screen and process of making it. 3,664,502, Cl. 209-397.

Nichols, Thomas Gilbert: *See—*
Hall, Stanley Rylon; and Nichols, Thomas Gilbert,3,665,512.

Nicholson, Eric Samuel: *See—*
Ashton, Stanley; and Nicholson, Eric Samuel,3,665,004.

Nicolas, Yves; and Bonnet, Jean-Loup, to Schlumberger Technology Corporation. Wireline well tool anchoring system. 3,664,416, Cl. 166-65.

Nielsen, Asger T., to Compufoto, Inc. Character generator employing pulsed beam interrogation of matrix. 3,665,453, Cl. 340-324.

Nielsen, Peter V., to Danfoss A/S. Passive temperature sensor. 3,664,193, Cl. 73-368.000

Nihon Kagaku Kizai Kabushiki Kaisha: *See—*
Kamiya, Nobuyuki; Funada, Kiyotaka; Shinohara, Takashi; and Imai, Hiroko, 3,664,860.

Nikkiso Co., Ltd.: *See—*
Sato, Ryuichi, 3,664,758.

Nilsson, Hans Robert, to Svenska Rotor Maskiner Aktiebolag. Rotary internal combustion engine and sealing means therefor. 3,664,778, Cl. 418-117.

Nippon Electric Co., Ltd.: *See—*
Kiji, Kazuo; Nishida, Nobuo; and Sakaguchi, Mitsuhito, 3,664,722.

Nippon Electric Company, Limited: *See—*
Fujimoto, Syoji, 3,665,265.

Nippon Electric Company, Ltd.: *See—*
Nakanuma, Sho; Tsujide, Tohru; Wada, Toshio; Igarashi, Ryo; and Onoda, Katsuhiro, 3,665,423.

Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Hirano, Katsuhiko, 3,665,091.
Sotome, Hiromi, 3,665,124.
Takabayashi, Yoshikazu, 3,664,911.

Nippon Kogaku K.K.: *See—*
Imai, Toshifumi, 3,664,749.

Nippon Kokan Kabushiki Kaisha: *See—*
Ando, Ryo; and Fukushima, Tsutomu, 3,664,827.
Kambayashi, Akira; Shun-ichi, Kawasaki; and Ehara, Takashi, 3,664,830.

Nippon Piston Ring Kabushiki Kaisha: *See—*
Sugahara, Eisuke, 3,664,153.

Nippon Seiko Kabushiki Kaisha: *See—*
Ooki, Nobugi; and Okubo, Kenzi, 3,663,992.

Nippondenso Kabushiki Kaisha: *See—*
Endo, Kunio, 3,664,311.
Kato, Takaaki; Kawakubo, Mamoru; Ito, Katsunori; and Wakamatsu, Hisato, 3,665,213.
Yonezu, Hisashi, 3,664,148.

Nishida, Nobuo: *See—*
Kiji, Kazuo; Nishida, Nobuo; and Sakaguchi, Mitsuhito,3,664,722.

Nitto Kohki Company Limited: *See—*
Saito, Noboru, 3,664,208.

Noble Drilling Corporation: *See—*
Rosser, Eugene P.; and Lorenz, Howard I., 3,664,442.

Noble, Hartsel Ledahl. Floor mat for stabilizing foot pedal box. 3,664,628, Cl. 248-350.

Noller, Harry F.; and Morris, John C., to Singer Company, The. Value selection setting means. 3,664,578, Cl. 235-101.000

Norden, Alexander R. Thermostat. 3,665,360, Cl. 337-100.000

Noren, Oscar B.: *See—*
Graham, Richard J.; Mottin, Ralph E.; and Noren, Oscar B.,3,664,495.

Norman, Melvin H.; and Hawthorne, Nathaniel F., to Singer Company, The. Braking device for a tape dispenser. 3,664,597, Cl. 242-75.400

Norman, Vello; and Williams, Thomas B., to Liggett & Myers Incorporated. Tobacco smoke filter. 3,664,352, Cl. 131-264.

Norris, Russell, to Procter & Gamble Company, The. Enzyme detergent composition containing coagglomerated perborate bleaching agent. 3,664,961, Cl. 252-99.

North American Rockwell Corporation: *See—*
Galli, Guido; and Coker, Jesse E., 3,664,867.
Hartmann, Frederick; and Huffmann, Billy J., 3,665,419.
Heimbigner, Gary Lee, 3,665,473.
Manasevit, Harold M., 3,664,866.
Miller, Norman C., 3,664,880.
Owens, John M.; and Sallee, Gary F., 3,665,211.

North Electric Company: *See—*
Blake, Richard K.; and Jotwani, Haresh C., 3,665,112.
Blake, Richard K.; De Hilster, Robert J.; and Porter, Warren Wesley, 3,665,113.

Norton Company: *See—*
Sioui, Richard H.; and Cohen, Harvey M., 3,664,819.

Norwegian Defence Research Establishment: *See—*
Barstad, Gotfred E. B., 3,665,198.

Novak, Michael J., to Hart Schaffner & Marx. Method of garment manufacture. 3,663,964, Cl. 2-243.

Novak, Steve. Bandage roll-up packaging device. 3,664,594, Cl. 242-60.000

Novotny, Raymond J., to Abex Corporation. Concrete ties. 3,664,584, Cl. 238-349.

Nunes, John F., Jr. Sod handling apparatus. 3,664,432, Cl. 172-19.

Nutt, Thomas O., III: *See—*
Nutt, Thomas O., Jr.; and Nutt, Thomas O., III,3,664,687.

Nutt, Thomas O., Jr.; and Nutt, Thomas O., III. Vehicle tow bar. 3,664,687, Cl. 280-491.000

Nutting, David J.: *See—*
Budnik, Roger J.; Montgomery, Harold S.; and Nutting, David J.,3,664,037.
Montgomery, Harold S.; and Nutting, David J.,3,664,562.

Nutting Industries, Ltd.: *See—*
Budnik, Roger J.; Montgomery, Harold S.; and Nutting, David J., 3,664,037.
Montgomery, Harold S.; and Nutting, David J., 3,664,562.

N.V. 'COQ': *See—*
Boersma, Rintje; and Irik, Gijsbert Waldemar, 3,665,135.
De Heus, Aart Arnoldus, 3,665,257.

N.V. Hollandse Signaalapparaten: *See—*
Ter Brugge, Hendrik, 3,664,200.

Oak Electro/Netics Corporation: *See—*
Ruppert, Albert L., 3,664,047.

Oakes, Vincent; and Iles, Brian Rodney, to Pure Chemicals Limited. Dialkyltin bis(substituted mercaptides). 3,665,024, Cl. 260-429.7

Oberg Manufacturing Co., Inc.: *See—*
Vecchi, John C., 3,664,258.

Oberhart, George S., to Day, Albert J., mesne. Card readout system. 3,665,161, Cl. 235-61.7

Oberhofer, Alfred W.; Anderson, Donald R.; and Payne, Charles C., to Nalco Chemical Company. Removal and separation of metallic oxide scale. 3,664,870, Cl. 134-3.000

Oberto, Giacomo: *See—*
Menicanti, Adriano; and Oberto, Giacomo,3,664,478.

Obitz, Magdalena: *See—*
Freller, Helmut; and Obitz, Magdalena,3,665,366.

Ochodnicky, Samuel S.: *See—*
Shea, James J.; and Ochodnicky, Samuel S.,3,665,201.

O'Connor, Daniel G., to Singer Company, The. Computer. 3,665,411, Cl. 340-172.5

Ocumpaugh, David E.: *See—*
Lee, Henry L., Jr.; Culp, Gordon W.; and Ocumpaugh, David E.,3,663,965.

Odan, Koji: *See—*
Okamura, Seizo; Odan, Koji; and Maruyama, Tsutomu,3,664,861.

O'Donnell, Charles A. Educational lens device for demonstrating optical principles. 3,664,727, Cl. 350-179.

Oepen, Karl. Method of and apparatus for the development of plant growth. 3,664,061, Cl. 47-1.2

Oga, Toshisaburo; and Okazaki, Ken, to Sumitomo Electric Industries, Ltd. Method of resin coating a metal and resin- coated metal product thereof. 3,664,888, Cl. 148-6.27

Ogawa, Terushige: *See—*
Wakazono, Yoshikazu; Ogawa, Terushige; and Otsuka, Yoshiyasu,3,664,897.

O'Grady, James R.: *See—*
Chatterjee, Anil K.; and O'Grady, James R.,3,664,277.

Ohio State University, The: *See—*
Toth, Louis S.; and Collins, Stuart A., Jr., 3,664,723.

Ohlswager, Stanley, to Atlantic Richfield Company. Method for cooling the reactor effluent from the oxidation of meta- or para-xylene. 3,665,033, Cl. 260-524.00r

Ohmart Corporation, The: *See—*
Cahill, Bonaventure B.; and Lyon, Wilfred W., 3,665,199.

Ohsawa, Mitsuo; and Mino, Shinziro, to Sony Corporation. Gate circuit. 3,665,320, Cl. 325-478.

Oka, Hiroyuki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Self force-increasing disk brake. 3,664,468, Cl. 188-72.200

Okamura, Seizo; Odan, Koji; and Maruyama, Tsutomu, to Kansai Paint Company Limited. Coating process. 3,664,861, Cl. 117-93.31

Okazaki, Ken: *See—*
Oga, Toshisaburo; and Okazaki, Ken,3,664,888.

Oki Electric Industry Company Limited: *See—*
Kumagai, Shun; and Koikeda, Toshiaki, 3,664,943.

Oktronics, Inc.: *See—*
Palmer, Ansell W.; and Earl, William C., 3,665,119.

Okubo, Kenzi: *See—*
Ooki, Nobugi; and Okubo, Kenzi,3,663,992.

Okvist, Nils Axel Gunnar: *See—*
Bergqvist, Mats Soren; Kallstrom, Olof Krister; Lagerberg, Per Goran Olof; and Okvist, Nils Axel Gunnar,3,664,825.
Meadus, Frederick W.; Puddington, Ira E.; and Okvist, Nils Axel Gunnar,3,664,824.

Olainsky Zavod Khimreaktivov: *See—*
Khusid, Iosif Efimovich; Bezgodova, Ljudmila Ivanovna; and Ruben, Mara Khugovna, 3,664,999.

Olcott, Raymond E.: *See—*
Easterly, Donald O.; and Olcott, Raymond E.,3,664,608.

Olin Corporation: *See—*
Winter, Joseph, 3,664,890.

Olinkraft, Inc.: *See—*
Hudson, Doyle R., 3,664,659.
Sherman, Earle C., 3,664,088.

Olivetti, Ing., C., & C., S.p.A.: *See—*
Menicanti, Adriano; and Oberto, Giacomo, 3,664,478.

Ollinger, James C.: *See—*
Brown, Milton G.; Ollinger, James C.; and Sienkiewicz, Joseph E.,3,665,177.

Olson, Robert A., to Glatfelter, P. H., Company. Self-bondable printing paper. 3,664,912, Cl. 161-161.

Olsson, Bertil Lennart. Vent plug for a filling opening of a cell of an electric storage battery. 3,664,879, Cl. 136-182.

Olsson, William J.: *See—*
Buswell, Richard F.; Nicholas, Peter G.; and Olsson, William J.,3,664,873.

Olympia Werke AG: *See—*
Helmers, Helmut; Werner, Georg; and Rix, Albert, 3,664,480.

Olympus Optical Co., Ltd.: *See—*
Yuta, Koichi, 3,664,728.

Olyphant, Murray, Jr.; Cartier, Michael David; and Freeman, Charles Robert, to Minnesota Mining and Manufacturing Company. Keepered plated-wire memory. 3,665,428, Cl. 340-174.0ja

Omori, Thomas T.: *See—*
Burtis, Wilson A.; and Omori, Thomas T.,3,664,446.

Omron Tateisi Electronics Co.: *See—*
Miyagawa, Takashi; Matsuo, Shunsuke; and Matsumoto, Masanori, 3,665,166.
Yamamoto, Mititaka; Kawahara, Kazuhiro; and Morita, Tadao, 3,665,162.

O'Neil, John J. Massage wheel. 3,664,334, Cl. 128-57.

Onishi, Akira; Fujio, Ryota; and Kojima, Minoru, to Bridgestone Tire Company Limited. Preparation of conjugated diene polymers using ate-compound catalysts. 3,665,062, Cl. 260-84.100

Onoda, Katsuhiro: *See—*
Nakanuma, Sho; Tsujide, Tohru; Wada, Toshio; Igarashi, Ryo; and Onoda, Katsuhiro,3,665,423.

Onoshima, Yoshio: *See—*
Hirota, Nobuyoshi; and Onoshima, Yoshio,3,664,965.

Ooki, Nobugi; and Okubo, Kenzi, to Nippon Seiko Kabushiki Kaisha. Loading mechanism applied to the drafting mechanism of a spinning machine. 3,663,992, Cl. 19-281.

Opti-Holding AG.: *See—*
Heimberger, Helmut; and Frohlich, Alfons, 3,663,996.

Ordena Lenina Fizichesky Institut Imeni P.N. Lebedeva Leninsky Prospekt: *See—*
Kozlov, Stanislav Fedorovich; and Konorova, Elena Alexandrovna, 3,665,193.

Orendorff, Maxwell C.; and Mattern, Harvey L., to Ely Enterprises, Inc. Actuatable stop. 3,664,515, Cl. 212-39.

Original Hanau Quarzlampen GmbH: *See—*
Kockott, Dieter, 3,664,188.

Orlova, Frida Abramovna; Seleznev, Georgy Vasilievich; and Bonjuk, Petr Veniaminovich. Method for protection of evaporator heating elements from corrosion. 3,664,885, Cl. 148-6.14

Orr, William H., to Bell Telephone Laboratories, Incorporated. Thin film distributed RC structure. 3,665,346, Cl. 333-70.

Orth, Peter, to Herberlein Patent Corporation. Process for measuring revolution speed of a body. 3,665,306, Cl. 324-174.

Osborne, Solomon C.: *See—*
Keller, Joseph D.; and Osborne, Solomon C.,3,665,367.

Oskar, John Raymond, to Mike-Master, Inc., mesne. Microphone attachment for guitars and similar stringed instruments. 3,665,490, Cl. 179-146.

Ostermayer, Franz: *See—*
Denss, Rolf; Clauson-Kaas, Niels; and Ostermayer, Franz,3,665,010.
Denss, Rolf; Clauson-Kaas, Niels; and Ostermayer, Franz,3,665,011.

Ostroff, Jerome: *See—*
United States of America,National Aeronautics and Space Administration, Administrator, 3,664,185.

Oswald, Donald R.: *See—*
Frank, Gerard A.; Kipp, Karl F.; and Oswald, Donald R.,3,664,872.

Otani, Hiroshi: *See—*
Yukami, Noboru; Otani, Hiroshi; and Kurokawa, Hideo,3,665,264.
Otis Engineering Corporation: *See—*
Deaton, Thomas Michael, 3,664,427.
Otsuka, Yoshiyasu: *See—*
Wakazono, Yoshikazu; Ogawa, Terushige; and Otsuka, Yoshiyasu,3,664,897.
Ouimet, Emil R. Shoe sole and method of making it. 3,664,040, Cl. 36-25.000
Ovitron Corporation: *See—*
Seelinger, Richard W., 3,664,309.
Owarfort, Rune T.: *See—*
Magnusson, Kjell I.; and Owarfort, Rune T.,3,664,531.
Owen, Ronald B.: *See—*
van den Heuvel, Anthony P.; Owen, Ronald B.; and Joshi, Shrinivas G.,3,665,225.
Owens, John M.; and Sallee, Gary F., to North American Rockwell Corporation. Surface acoustic wave computer logic elements. 3,665,211, Cl. 307-117.000
Owens-Corning Fiberglas Corporation: *See—*
Morrison, Albert R.; and Haynes, Harold L., 3,664,855.
Preston, Jerome A.; and Davis, Carlton J., Sr., 3,664,982.
Owens-Illinois, Inc.: *See—*
Budzynski, Leonard M.; and Leuck, Donald D., 3,665,401.
Leuck, Donald D., 3,665,400.
Schmersal, Larry J.; Miavecz, Joseph L.; Pierce, Edward W.; and Wojcik, David S., 3,665,455.
Oya, Tsutom; and Ebine, Kiyoshi, to Japan Business Automation Co., Ltd. Tokyo Shibaura Electric Co., Ltd. System for controlling tape read-out devices. 3,665,435, Cl. 340-174.1
Pacific Associated Lighting, Inc.: *See—*
Shane, Berwyn E., 3,663,990.
Pacific Fast Mail: *See—*
Longnecker, Robert H., 3,664,060.
Pacific Roller Die Co., Inc.: *See—*
Davis, Paul K., 3,664,170.
Paczkowski, John Paul: *See—*
Collard, Jacques Roger; Narayan, Subrahmanyam Yegna; and Paczkowski, John Paul,3,665,254.
Painton, Richard C.: *See—*
Bresson, Richard J.; and Painton, Richard C.,3,664,245.
Painton, Richard C., to Eastman Kodak Company. Indicating apparatus for exposure control apparatus. 3,664,244, Cl. 95-10.
Pajulaid, Manivald Maximovich; and Tooming, Khugo Gustavovich. Apparatus for sewing together net sheets. 3,664,694, Cl. 289-18.
Palmer, Ansell W.; and Earl, William C., to Oktronics, Inc., mesne. Magnetic recording device employing novel head mounting mechanism. 3,665,119, Cl. 179-100.2
Palmer, Harry E., to Golden Arrow Manufacturing Limited. Diaphragm pumps. 3,664,770, Cl. 417-383.
Palsa, Helmut: *See—*
Gerke, Peter; Rutkowski, Karl; Bock, Helmuth; and Palsa, Helmut,3,665,110.
Palumbo, Nunzio J.; and Macione, Jack F. Combination lock and deterrent. 3,664,276, Cl. 109-29.
Panariti, Viktor Mitrushi. Fluid pump. 3,664,772, Cl. 417-486.
Pande, Kailash Chandra: *See—*
Chadha, Rajendra Nath; and Pande, Kailash Chandra,3,664,997.
Panzer, Jerome, to Esso Research and Engineering Company. Lubricating oil compositions of improved thermal stability. 3,664,955, Cl. 252-47.5
Papadakis, Emmanuel P., to Bell Telephone Laboratories, Incorporated. Nonuniform pressure bonding method. 3,664,902, Cl. 156-580.
Paramonoff, Elpidifor, to Standun, Inc. Stripper for apparatus such as metallic can body former. 3,664,171, Cl. 72-344.
Paris, Ray J.; and Rudd, Harry M., to Teledyne Mid-America Corporation. Terminal block and method of making the same. 3,665,376, Cl. 339-198.
Parke, Davis & Company: *See—*
Graham, Richard J.; Mottin, Ralph E.; and Noren, Oscar B., 3,664,495.
Parnet, Bernard, to Compagnie de Saint-Gobain. Handling and transferring device for plane objects, particularly glass sheets. 3,664,520, Cl. 214-7.
Paros, Jerome M., to Sundstrand Data Control, Inc., mesne. Pressure sensor. 3,664,237, Cl. 92-38.
Parry, Keith S.: *See—*
Webb, Robert M.; and Parry, Keith S.,3,665,209.
Parshad, Ram, to Research Corporation. Intercommunication system. 3,665,106, Cl. 179-1.
Parsons, Walter E.: *See—*
Richards, Leo O.; and Parsons, Walter E.,3,665,303.
Partain, James H.; and Johnson, Richard H., to Stone Container Corporation. Mailing container with cushioning cell construction. 3,664,573, Cl. 229-40.
Partridge, Gerald J., to Robbins, Jim, Seat Belt Company. Double locking retractable seat belt assembly. 3,664,599, Cl. 242-107.400
Pasin, Z. Joseph, to Balchem Corporation. Encapsulation process. 3,664,963, Cl. 252-316.000
Passaggio, Charles, to Scovill Manufacturing Company. Control for a reciprocating fluid motor. 3,664,377, Cl. 137-625.690
Pataki, Andrew B., to Sperry Rand Corporation. Shaft positioning apparatus. 3,664,203, Cl. 74-55.
Paton, Boris Evgenievich; Lebedev, Vladimir Konstantinovich; Medovar, Boris Izrailevich; Pentegov, Igor Vladimirovich; Latash, Jury Vadimovich; Bondarenko, Oleg Petrovich; Baglai, Vitaly Mikhailovich; Podola, Nikolai Vasilievich; and Emelyanenko, July Georgievich. Apparatus for electroslag remelting of consumable electrodes. 3,665,081, Cl. 13-12.
Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Bondarenko, Oleg Petrovich; Latash, Jury Vadimovich; Baglai, Vitaly Mikhailovich; and Shirshov, Vladimir Grigorievich. Electroslag remelting of consumable electrodes. 3,665,488, Cl. 13-9.
Paton, Neil E., to Ionics, Incorporated. Lead alloy. 3,664,832, Cl. 75-166.
Patrie, Jos, to Cegedur GP. Objects of aluminum and alloys of aluminum having colored coatings and process. 3,664,932, Cl. 204-35.
Patterson, Velt C. Hot gas refrigeration defrosting system. 3,664,150, Cl. 62-234.
Paul, Fred: *See—*
Morris, Thomas B.; Paul, Fred; and Powell, Barney R.,3,665,146.
Pauli, Gunter: *See—*
Euer, Hartmut; and Pauli, Gunter,3,665,505.
Pause, Kurt, to Maschinenfabrik Buckau R. Wolf Aktiengesellschaft. Spindle for centrifuges. 3,664,151, Cl. 64-1.000
Payne, Charles C.: *See—*
Oberhofer, Alfred W.; Anderson, Donald R.; and Payne, Charles C.,3,664,870.
Payne, Robert A.; and Van der Molen, John F., to Stewart-Warner Corporation. Zero offset numerical servo machine control system. 3,665,280, Cl. 318-572.
Pear, Charles B., Jr., to Potter Intrument Company, Inc. Method and system for high density recording of information on premagnetized magnetic tape. 3,665,485, Cl. 346-74.00m
Pear, Charles B., Jr.: *See—*
Murray, Joseph John; and Pear, Charles B., Jr.,3,665,436.
Pearl, David L.; Waller, John G.; and Head, Beverly P., Jr., to Grace, W. R., & Co. Egg carton. 3,664,574, Cl. 229-44.00r
Pedersen, Kristian Stausholm, to Danfoss A/S. Method for running in metal components. 3,664,886, Cl. 148-6.15r
Pedigo, Richard A. Grass-clippings pelletizer for lawnmowers. 3,664,097, Cl. 56-1.
Peerless Mfg. Co.: *See—*
Petelski, Nick, 3,664,529.
Peil, William, to General Electric Company. Signal processor for reception of amplitude or frequency modulated signals. 3,665,507, Cl. 325-315.000
Peirce, Inez H. Cooking grill. 3,664,256, Cl. 99-425.000
Pellaton, Jean: *See—*
Stalder, Herbert; and Pellaton, Jean,3,664,110.
Pelta, Edmond R.; and Gold, Kenneth Stewart, to Autoscan, Inc. System for determining the ignition advance in the distribution of an engine. 3,665,294, Cl. 324-16.
Penberthy, Walter L., Jr.; Bayless, Jack H.; and West, Robert C., to Esso Production Research Company. Method for insulating a well. 3,664,424, Cl. 166-303.000
Penberthy, Walter L.; Bayless, Jack H.; and Ayers, Robert C., Jr., to Esso Production Research Company. Well insulation method. 3,664,425, Cl. 166-303.000
Pendergrass, Buford; Applequist, Quintin A.; and Snyder, Alan Howard, Jr., to Roberts Industries, Inc. Take-up apparatus. 3,664,717, Cl. 308-15.
Pennwalt Corporation: *See—*
Atkiss, Thomas Clifford, 3,664,887.
Sibley, Joseph F., 3,664,784.
Pentegov, Igor Vladimirovich: *See—*
Paton, Boris Evgenievich; Lebedev, Vladimir Konstantinovich; Medovar, Boris Izrailevich; Pentegov, Igor Vladimirovich; Latash, Jury Vadimovich; Bondarenko, Oleg Petrovich; Baglai, Vitaly Mikhailovich; Podola, Nikolai Vasilievich; and Emelyanenko, July Georgievich,3,665,081.
Perevozchikov, Evgeny Titovich: *See—*
Shtin, Lev Mikhailovich; Grebnev, Nikolai Feodosovich; Satovskaya, Ljudmila Sergeevna; Rasseikin, Mikhail Grigorievich; Khirdzhiev, Sergei Grigorievich; Perevozchikov, Evgeny Titovich; Zagulina, Sofia Stepanovna; Duda, Vladimir Nikolaevich; and Karasev, Mikhail Andreevich,3,664,168.
Perkins, Neale A., to Safariland Ltd., Inc. Belt. 3,664,560, Cl. 224-5.00r
Peroni, Peter A.; and Jones, John Paul, Jr., to Navigation Computer Corporation. Universal modular printed circuit magnetic reed keyboard switch assembly. 3,664,014, Cl. 29-622.
Perper, Robert J., to Upjohn Company, The. Process for separating horse gamma globulin fractions by chromatography. 3,664,994, Cl. 260-112.
Perrin, Dennis William: *See—*
Searle, John Albert; and Perrin, Dennis William,3,664,038.
Perry, Max W.; and Brockelsby, Norman D., to Dutton-Lainson Company. Hand pump oiler. 3,664,556, Cl. 222-385.
Petelski, Nick, to Peerless Mfg. Co. Apparatus for manipulating load supporting member. 3,664,529, Cl. 214-140.
Peterli, Hans Jakob; Keller, Ernst; and Schwarzenbach, Kurt, to Ciba-Geigy Corporation. Water-soluble phenolic antioxidants. 3,665,031, Cl. 260-507.

Peters, Pete P.: *See—*
Laval, Claude C., Jr.; and Peters, Pete P.,3,664,136.
Petersen, Richard D.; and Kozinski, Allen A., to Standard Oil Company. Platinum reforming with a mordenite containing support using two reactors. 3,664,949, Cl. 208-65.
Petersen, Victor, to General Motors Corporation. Cylinder head gasket assembly. 3,664,676, Cl. 277-166.000
Peterson, Max E., to Collins Radio Company. Proportional digital control for radio frequency synthesizers. 3,665,323, Cl. 328-14.000
Petrohilos, Harry G., to United Systems Corporation. Analog to digital converter with automatic calibration. 3,665,305, Cl. 324-99.00d
Petrolite Corporation: *See—*
Redmore, Derek, 3,664,807.
Petros, Andrew J.; and Rybar, Clement S., to Mesta Machine Company. Powered turnaround for a coil lift and transfer car and the like. 3,664,518, Cl. 214-1.
Petrov, Gennady Nikolaevich; Lisochkin, Grigory Fedorovich; Shmagin, Valentin Parmenovich; and Shibanova, Olga Mikhailovna. Methods for the preparation of synthetic polymers. 3,664,989, Cl. 260-82.1
Petruzzella, Nicholas L.: *See—*
Amidon, Alan B.; Sankus, Joseph G.; Petruzzella, Nicholas L.; and Ewing, Joan R.,3,664,834.
Petty, George E.: *See—*
Wray, Gary Q.; and Petty, George E.,3,664,415.
Pfannmueller, Helmut: *See—*
Trieschmann, Hans-Georg; Pfannmueller, Helmut; Gropper, Hans; Gierth, Volker; and Beck, Gilbert,3,664,988.
Phares, Bruce G.: *See—*
Hutch, Frederick S.; and Phares, Bruce G.,3,665,414.
Phillipps, Gordon Hanley: *See—*
Elks, Joseph; Phillipps, Gordon Hanley; and Tulley, Alan,3,665,021.
Phillips Petroleum Company: *See—*
Cleary, James W., 3,665,056.
Uraneck, Carl A.; and Burleigh, John E., 3,664,978.
Young, Jerry W., 3,664,901.
Phillips Petroleum Corporation: *See—*
Nevin, John B., 3,664,782.
Phone-Poulenc S.A.: *See—*
Jolles, Georges, 3,665,018.
Pickard, Henry Maurice Hattersley. Swing bolts. 3,664,700, Cl. 292-256.75
Pickering, John J. Fishing rig and means for handling same. 3,664,054, Cl. 43-19.000
Pierce, Edward W.: *See—*
Schmersal, Larry J.; Miavecz, Joseph L.; Pierce, Edward W.; and Wojcik, David S.,3,665,455.
Pierce, Howard E., Jr.: *See—*
Sevc, John M.; and Pierce, Howard E., Jr.,3,664,016.
Pierson, William D., to Sparton Corporation. Velocity gauge. 3,664,175, Cl. 73-1.
Pilarczyk, Karol, to Carrier Corporation, mesne. Method of changing capacity of fluid reaction device. 3,664,001, Cl. 29-156.4
Pinkham, Roger A., to EG&G, Inc. Automatic compensation apparatus for the marking positions of each stylus of a multistylii facsimile recorder. 3,665,100, Cl. 178-6.606
Pinkham, Roger A., to EG&G, Inc., mesne. Switching apparatus for each stylus of a multistylii facsimile recorder. 3,665,101, Cl. 178-6.60r
Pinkham, Roger A., to EG&G, Inc., mesne. Phasing and backstroke black control circuit for facsimile. 3,665,104, Cl. 178-69.50f
Piper, John L. Necktie. 3,663,961, Cl. 2-153.
Piper, Thomas E., to United States of America, Navy, mesne. Apparatus for preventing carbon diffusion in electric discharge sintering. 3,665,151, Cl. 219-149.
Pithan, Fritz: *See—*
Heidrich, Klaus; Krewitt, Alfred; Loos, Kurt; and Pithan, Fritz,3,664,619.
Pitney-Bowes, Inc.: *See—*
Conklin, Joseph P., 3,664,445.
Hanson, Walter J., 3,664,231.
Ryland, Peter M., 3,664,656.
Plessey Handel und Investments A.G.: *See—*
Wheaton, Roger W., 3,665,503.
Plumb, Harry A., Jr.: *See—*
Born, Norman E.; Kolatorowicz, Edwin E.; and Plumb, Harry A., Jr.,3,665,274.
Plymouth Flush Door, Inc.: *See—*
Fritze, William R.; and Scarlett, Wallace W., 3,664,009.
Podola, Nikolai Vasilievich: *See—*
Paton, Boris Evgenievich; Lebedev, Vladimir Konstantinovich; Medovar, Boris Izrailevich; Pentegov, Igor Vladimirovich; Latash, Jury Vadimovich; Bondarenko, Oleg Petrovich; Baglai, Vitaly Mikhailovich; Podola, Nikolai Vasilievich; and Emelyanenko, July Georgievich,3,665,081.
Poe, Lloyd Richard, to Hartwell Corporation. Latch adjuster. 3,664,696, Cl. 292-66.
Pokrovskaya, Inna Evgenievna: *See—*
Menyailo, Anatoly Tikhonovich; Pospelov, Mikhail Valerievich; Kaliko, Olga Romanovna; Pokrovskaya, Inna Evgenievna; Fedorova, Valentine Vsevolodovna; Shilnikova, Albina Georgievna; Yakovleva, Antonina Karpovna; and Narozhenko, Tamara Georgievna,3,664,810.
Polaroid Corporation: *See—*
Baker, James G., 3,664,065.
Land, Edwin H., 3,664,250.
Pollution Engineering International, Inc.: *See—*
Armstrong, Louis B., 3,664,951.
Polly, Edgar: *See—*
Brune, Werner; Schwartz, Gunter; Dull, Ernst Hermann; and Polly, Edgar,3,665,393.
Polumbus, Emile A., Jr. Accessory for footwear. 3,664,043, Cl. 36-71.000
Polysius AG: *See—*
Weber, Paul; Ritzmann, Horst; and Butschko, Gerhard, 3,664,650.
Pool, Horace E. Orthodontic separating spring. 3,664,023, Cl. 32-14.
Pope, Joseph O., Jr. Apparatus for making rotary cutting dies. 3,664,030, Cl. 33-184.000
Pope, Kenneth E., to Cas, Inc., mesne. Apparatus for controlling tape speed. 3,665,438, Cl. 340-174.1
Popelak, Alfred; Lerch, Ansgar; Stach, Kurt; Roesch, Egon; and Hardebeck, Klaus, to Boehringer Mannheim GmbH. 5-Phenyl-tetrazole derivatives. 3,665,002, Cl. 260-239.9
Porter, Warren Wesley: *See—*
Blake, Richard K.; De Hilster, Robert J.; and Porter, Warren Wesley,3,665,113.
Pospelov, Mikhail Valerievich: *See—*
Menyailo, Anatoly Tikhonovich; Pospelov, Mikhail Valerievich; Kaliko, Olga Romanovna; Pokrovskaya, Inna Evgenievna; Fedorova, Valentine Vsevolodovna; Shilnikova, Albina Georgievna; Yakovleva, Antonina Karpovna; and Narozhenko, Tamara Georgievna,3,664,810.
Potter Instrument Company, Inc.: *See—*
Murray, Joseph John; and Pear, Charles B., Jr., 3,665,436.
Potter Intrument Company, Inc.: *See—*
Pear, Charles B., Jr., 3,665,485.
Pottiez, Fernand; and Verbeest, Raphael, to UCB, Societe Anonyme. Process for the regeneration of alkanolamines by distillation, alkali hydroxide treatment, heat, phase separation and distillation. 3,664,930, Cl. 203-37.
Potvin, Alfred M. Sanitary disposal device. 3,664,576, Cl. 232-43.2
Pourrias, Bernard M.: *See—*
Fauran, Claude P.; Raynaud, Guy M.; Pourrias, Bernard M.; and Douzon, Colette A.,3,665,014.
Powell, Barney R.: *See—*
Morris, Thomas B.; Paul, Fred; and Powell, Barney R.,3,665,146.
Power Systems and Controls, Incorporated: *See—*
Carter, Robert; Amos, Ralph A.; and Gregory, Charles A., Jr., 3,665,495.
Powers, Gale A.: *See—*
Aweida, Jesse I.; Arthur, William C.; and Powers, Gale A.,3,664,604.
Poylo, Michael C., to International Telephone and Telegraph Corporation. Minikin audio system. 3,665,087, Cl. 35-17.
Poyner, James, to Dunlop Holding Limited. Wheels. 3,664,405, Cl. 152-375.000
PPG Industries, Inc.: *See—*
Ackley, Richard H., 3,664,909.
Doran, Thomas J.; Wagner, Melvin P.; and Stevens, Henry C., 3,664,403.
Praddaude, Pierre A., to Societe Anonyme Poclain. Hydraulic power transmissions. 3,664,127, Cl. 60-53.
Pratt, Arnold T.: *See—*
Seaton, William Joe; and Pratt, Arnold T.,3,665,462.
Preco, Inc.: *See—*
Salisbury, Robert E.; and Erickson, John W., 3,664,757.
Preformed Line Products Company: *See—*
D'Agati, John R., 3,664,010.
Preger, Max: *See—*
Fritze, Hartwig; Eisenmann, Wolfhart; and Preger, Max,3,664,033.
Preissinger, Karl-Heinz: *See—*
Behn, Reinhard; Preissinger, Karl-Heinz; and Simson, Reiner,3,665,268.
Prener, Jerome S.: *See—*
Kingsley, Jack D.; and Prener, Jerome S.,3,664,862.
Prentky, Peter I.; and Wilson, Alonzo A., to International Business Machines Corporation. Noise discriminator for digital data detection system. 3,665,327, Cl. 328-163.000
Preston, Jerome A.; and Davis, Carlton J., Sr., to Owens-Corning Fiberglas Corporation. Reaction product of hydrolyzed siloxane and an imine polymer and glass strands coated therewith. 3,664,982, Cl. 260-29.4
Price, John R., to Leigh Products, Inc. Pegboard hook for alternate thickness pegboards. 3,664,625, Cl. 248-223.
Price, Kenneth R., to Huyck Corporation. Industrial conveyor belts. 3,664,907, Cl. 161-89.000
Price, Paul B.: *See—*
Alter, Henry Ward; and Price, Paul B.,3,665,194.
Pringle, Frank E., Jr.: *See—*
James, Robert C.; Wilson, David A.; and Pringle, Frank E., Jr.,3,664,086.
Procter & Gamble Company, The: *See—*
Bedenk, William T.; and Purves, Edward R., 3,664,848.
Logan, Ted J., 3,664,983.
Norris, Russell, 3,664,961.

Proctor, Charles D. Diagnostic test for schizophrenia. 3,665,071, Cl. 424-9.000

Product Design & Manufacturing Corporation: *See—*
Spropkay, George P., 3,664,698.

Proll Products Co.: *See—*
Heiman, Udo G., 3,665,092.

Pryor, Timothy R. Method and device for measuring strain and other changes in dimension. 3,664,739, Cl. 256-32.

Przygocki, Julius V.: *See—*
Barkovitz, William E.; and Przygocki, Julius V.,3,664,094.

Puchkoff, Zalman P.; and Topazio, Vincent. Foldable shirt packaging box and carrying container. 3,664,572, Cl. 229-40.

Puddington, Ira E.: *See—*
Meadus, Frederick W.; Puddington, Ira E.; and Okvist, Nils Axel Gunnar,3,664,824.

Puerner, George O., to Mallory, P. R., & Co., Inc. Two switch actuator means. 3,665,137, Cl. 200-172.00a

Pullman Incorporated: *See—*
Stark, Marvin; and Knippel, Willis H., 3,664,270.

Pulp and Paper Research Institute of Canada: *See—*
Clayton, David W.; and Sakai, Asahi, 3,664,918.
Clayton, David W.; and Sakai, Asahi, 3,664,919.

Pure Chemicals Limited: *See—*
Oakes, Vincent; and Iles, Brian Rodney, 3,665,024.

Puritan-Bennett Corporation: *See—*
Bartels, Harold, 3,664,361.

Purves, Edward R.: *See—*
Bedenk, William T.; and Purves, Edward R.,3,664,848.

Puzik, Otto V.: *See—*
De Vito, Angelo R.; and Puzik, Otto V.,3,664,697.

Quaker Oats Company, The: *See—*
Hyldon, Roy G., 3,664,846.
Hyldon, Roy G., 3,664,847.

Quan, William: *See—*
Sanders, Ray W.; Keyes, Neil T.; and Quan, William,3,665,405.

Quayle, Joshua Creer; Greatrix, Graham Roland; and Coombe, Ronald Alan, to National Research Development Corporation. Apparatus for the detection of mastitis in milk animals. 3,664,306, Cl. 119-14.14

Questor Corporation: *See—*
Mette, Herbert B., 3,664,535.

Quick, Graeme R., to Iowa State University Research Foundation. Combine cleaning blower. 3,664,349, Cl. 130-27.

Quick Service Textiles, Inc.: *See—*
Miller, Samuel E., 3,663,963.

Rabideau, Gerald T., to Mio Marine Corporation. Knockdown pontoons for portable boats and the combination thereof. 3,664,285, Cl. 114-0.5

Radiation Incorporated: *See—*
Roberts, Howard N., 3,664,721.

Radtke, Herbert W. Humidifer. 3,664,324, Cl. 126-113.

Raether, Siegfried, to Kalle Aktiengesellschaft. Process for the preparation of an aluminum support for presensitized planographic printing plates. 3,664,934, Cl. 204-58.

Rahnke, Christian J., to Ford Motor Company. Turbine wheel. 3,664,766, Cl. 416-244.000

Raleigh, William F., to Carrier Corporation. Furnace having multiple speed motor and accessory control system. 3,664,414, Cl. 165-26.000

Ralet, Claude Marie Ernest; and Ralet, Daniel Albert Clement. Method of an apparatus for the automatic supervision of liquid limits in closed tanks. 3,664,365, Cl. 137-206.000

Ralet, Daniel Albert Clement: *See—*
Ralet, Claude Marie Ernest; and Ralet, Daniel Albert Clement,3,664,365.

Ramsey, Willard A.: *See—*
Minchey, Jerry M.; and Ramsey, Willard A.,3,664,383.

Ransohoff, Jackson A., to Neutron Products Inc. Pool irradiator with radiation source in a rotating container. 3,665,183, Cl. 250-52.

Rashidov, Faizulla Karimovich: *See—*
Akhmedov, Rustam Berovich; Talibdzhanov, Zakhidzhan Sadykdzhanovich; Valikhodzhaev, Asomkhodzha; and Rashidov, Faizulla Karimovich,3,664,587.

Raskin, Archie, to Componentry Research and Development Enterprise, Inc. Office machine anti-theft locking apparatus. 3,664,616, Cl. 248-25.000

Rasseikin, Mikhail Grigorievich: *See—*
Shtin, Lev Mikhailovich; Grebnev, Nikolai Feodosovich; Satovskaya, Ljudmila Sergeevna; Rasseikin, Mikhail Grigorievich; Khirdzhiev, Sergei Grigorievich; Perevozchikov, Evgeny Titovich; Zagulina, Sofia Stepanovna; Duda, Vladimir Nikolaevich; and Karasev, Mikhail Andreevich,3,664,168.

Ratajczyk, James Daniel: *See—*
Swett, Leo Ralph; and Ratajczyk, James Daniel,3,665,008.

Ratcliff, Ralph A. Indicia applying article and method. 3,664,913, Cl. 161-167.

Rauh, Charles Edward: *See—*
Gray, William David; and Rauh, Charles Edward,3,665,075.

Rawdon, Albert H., Jr., to Riley Stoker Corporation. Method and apparatus for producing steam. 3,664,307, Cl. 122-1.

Raye, George W.; Dumas, Henry J., Jr.; and Duncan, Lloyd N., to American Kitchen Foods, Inc., mesne. Apparatus and method for detecting and processing materials according to color or shade variations thereon. 3,664,397, Cl. 146-117.00r

Raynaud, Guy M.: *See—*
Fauran, Claude P.; Raynaud, Guy M.; Pourrias, Bernard M.; and Douzon, Colette A.,3,665,014.

Raytheon Company: *See—*
Derby, Palmer P., 3,664,039.
Fassett, Matthew, 3,665,480.
Walsh, George M.; and Chramiec, Mark A., 3,665,413.

RCA Corporation: *See—*
Collard, Jacques Roger; Narayan, Subrahmanyam Yegna; and Paczkowski, John Paul, 3,665,254.
Crow, Robert Palmer, 3,665,317.
Einthoven, Willem Gerard; and Donnell, Howard Kenneth, 3,664,894.
Giaimo, Edward Charles, Jr., 3,664,298.
Goun, Nathan M.; and Wheatley, Carl F., Jr., 3,665,256.
Kuznetzoff, Philip, 3,663,997.
Silverman, Herbert William, 3,665,504.

Reber, Walter. Cutter mechanism for agricultural machines or lawn mowers. 3,664,102, Cl. 56-295.000

Record Watch Co., S. A.: *See—*
Golay, Jean-Pierre; and Gerber, Bernard, 3,664,120.

Redman, Howard E.; and Kalning, Frederick E. Mattress closing machine with automatic positioning means for a mattress assembly. 3,664,280, Cl. 112-3.

Redmore, Derek, to Petrolite Corporation. Use of phosphonium compounds as corrosion inhibitors. 3,664,807, Cl. 21-2.500

Reed, Dwight L. Adjustable stand. 3,664,629, Cl. 248-445.

Reed, Gaylard O., to Salem Equipment, Inc. Log pre-centering apparatus for veneer lathes. 3,664,395, Cl. 144-209.

Reed, Glenn A.: *See—*
Budrow, Jack C.; and Reed, Glenn A.,3,665,477.

Reed, L. J., to Motorola, Inc. Resonant circuit transistor oscillator system. 3,665,342, Cl. 331-109.000

Reese, Frank L.; and Dakin, Hayes O., Jr., to Westinghouse Electric Corporation. Delayed-acting blast valve operator construction. 3,665,133, Cl. 200-148.

Regan Forge and Engineering Company: *See—*
Watkins, Bruce J., 3,664,376.

Regel, Erik: *See—*
Buchel, Karl Heinz; Regel, Erik; Grewe, Ferdinand; Scheinpflug, Hans; and Kaspers, Helmut,3,665,076.
Buchel, Karl-Heinz; Regel, Erik; Grewe, Ferdinand; Scheinpflug, Hans; and Kaspers, Helmut,3,665,077.
Buchel, Karl-Heinz; Regel, Erik; Grewe, Ferdinald; Scheinpflug, Hans; and Kaspers, Helmut,3,665,078.
Buchel, Karl-Heinz; Regel, Erik; Grewe, Ferdinand; Scheinpflug, Hans; and Kaspers, Helmut,3,665,079.

Regency Electronics, Inc.: *See—*
Hoffman, Stephen J.; and Schonegg, Louis E., 3,665,318.

Rehhausser, Frederick V.; Earnest, Elmer Dean; Bock, Robert V.; Gerbstadt, Frederick H.; and Monek, James J., to Burroughs Corporation. Information processing system implementing program structures common to higher level program languages. 3,665,421, Cl. 340-172.500

Rehkopf, Charles H.: *See—*
Ng, David M.; and Rehkopf, Charles H.,3,664,295.

Reichel, Sigrid, to Institut fur Silikon-und Fluorkarbon-Chemie. Process for preparing gamma-aminopropylalkoxy- silanes and gamma-aminopropylalkylalkoxysilanes. 3,665,027, Cl. 260-448.8

Reichle, Alfred: *See—*
Kubitzek, Harry; Essig, Karl-August; Von Falkai, Bela; Reichle, Alfred; and Bodesheim, Ferdinand,3,664,914.

Reid, John D., to Hamilton Company. Bistable pneumatic flip flop apparatus. 3,664,374, Cl. 137-596.200

Reifenhauser, Fritz; and Klein, Josef, to Reifenhauser KG. Manifold arrangement for an extrusion assembly. 3,664,796, Cl. 425-208.

Reifenhauser KG: *See—*
Reifenhauser, Fritz; and Klein, Josef, 3,664,796.

Reiner, Norbert L., to Coleco Industries, Inc. Centrifugal pump. 3,664,760, Cl. 415-170.

Reiners, Walter: *See—*
Fritz, Egon, 3,664,154.

Reitz, David C.: *See—*
Ibach, William F.; Looney, Franklin S., Jr.; and Reitz, David C.,3,664,381.

Renzi, Kazimer. Creel with tubular yarn guide. 3,664,602, Cl. 242-131.000

Research Corporation: *See—*
Kaye, Howard, 3,664,991.
Parshad, Ram, 3,665,106.
Schwarz, Helmut J., 3,665,245.

Research Development Co.: *See—*
Victor, Irving, 3,664,806.

Revas, Leon, to Hansel, Otto, GmbH. Method of and apparatus for releasing of objects to a transporting device. 3,664,483, Cl. 198-32.

Rex Chainbelt Inc.: *See—*
Hudis, Michael I., 3,664,448.

Reynolds Guyer, Inc.: *See—*
Mergens, Gerald R., 3,664,494.

Reynolds Metals Company: *See—*
Cvacho, Daniel S., 3,664,172.

Rheinstahl Huttenwerke: *See—*
Kraemer, Friedrich; Mandel, Jorn; Mayer, Siegfried; Rohrig, Klaus; Schulz, Hans-Peter; Weidenmuller, Hilmar; Haverkamp, Klaus Dieter; and Motz, Jurgen, 3,664,826.

Ricca Data Systems, Inc.: *See*—
Beveridge, Robert W.; and Macaluso, Felix, 3,665,164.
Rice, Herbert L.; Cizek, Arthur; and Thaemar, Marvin O., to Milchem Incorporated. Acrylic composition for water treatment and process for making same. 3,665,035, Cl. 260-537.
Rich, Theodore A., to Environmental Technology, Incorporated. Self adjusting-short pulse detecting and amplifying circuit. 3,664,740, Cl. 356-37.000
Richards, John Charles Shenstone: *See*—
Lees, Alexander; Richards, John Charles Shenstone; and Jason, Alfred Charles,3,665,302.
Richards, Leo O.; and Parsons, Walter E. System for automatically and manually testing lines for determining of information can be accurately transmitted thereon. 3,665,303, Cl. 324-73.000
Richardson, James H., Jr., to CFSI Steel Corporation. Wire pay-off apparatus. 3,664,601, Cl. 242-129.
Richmond, Kenneth D., to Dayco Corporation. Method of making power transmission belts. 3,665,069, Cl. 264-219.000
Richter, Henry L., Dr., Corporation: *See*—
Richter, Henry L., 3,665,197.
Richter, Henry L., to Richter, Henry L., Dr., Corporation. Radiation dosimeter using gas of greater electron affinity and molecular moss than air. 3,665,197, Cl. 250-83.3
Rickmeier, Carl H., Jr., to Vollrath Co., The. Carafes. 3,664,553, Cl. 222-183.
Ride-Rite Corporation: *See*—
Thaxton, Ellis B., 3,664,681.
Riedel Wolfgang, to Bosch, Robert, Photokino GmbH. Device for deflecting the leaders of convoluted photographic films or the like. 3,664,606, Cl. 242-192.000
Riegel Textile Corporation: *See*—
Brocklehurst, Charles E., 3,664,223.
Ries, Robert J.: *See*—
Knox, Kenneth H.; and Ries, Robert J.,3,664,338.
Riggles, William M., Jr.: *See*—
Smith, James W., Sr.; Evans, Benjiman E.; Riggles, William M., Jr.; and Schormann, Urmas,3,664,456.
Riley, Robert E., Jr., to Scientific Security Systems, Incorporated. Detection system. 3,665,445, Cl. 340-261.
Riley Stoker Corporation: *See*—
Rawdon, Albert H., Jr., 3,664,307.
Riordan, Hugh E.; and Moncher, Frank L., to Kelsey-Hayes Company. Skid control system utilizing vehicle deceleration. 3,664,713, Cl. 303-21.
Ritchie, David S., to Barr and Stroud Limited. Sight-taking periscope. 3,664,747, Cl. 356-140.
Ritchie, E. S., & Sons, Inc.: *See*—
Sherman, Allen Butman, 3,664,292.
Ritzmann, Horst: *See*—
Weber, Paul; Ritzmann, Horst; and Butschko, Gerhard,3,664,650.
Rivoire, Andre, to Lux-Optical. Composite eyeglass frame. 3,664,734, Cl. 351-83.
Rix, Albert: *See*—
Helmers, Helmut; Werner, Georg; and Rix, Albert,3,664,480.
Robbins, Jim, Seat Belt Company: *See*—
Partridge, Gerald J., 3,664,599.
Roberson, James H., to Crompton & Knowles Corporation. Apparatus for plucking a dense mass of fibers. 3,663,993, Cl. 19-80.
Roberts, Arthur S.; and Craig, Orlyn W., to Sperry Rand Corporation. Zero crossing solid state switch. 3,665,212, Cl. 307-252.
Roberts, Ernest Roth, to Aerojet-General Corporation. Dimpled heat transfer walls for distillation apparatus. 3,664,928, Cl. 202-236.
Roberts, Howard N., to Radiation Incorporated. Data storage and retrieval method and apparatus. 3,664,721, Cl. 350-3.5
Roberts Industries, Inc.: *See*—
Pendergrass, Buford; Applequist, Quintin A.; and Snyder, Alan Howard, Jr., 3,664,717.
Robertshaw Controls Company: *See*—
Hild, Henry F.; Manecke, Siegfried E.; and Shaw, James L., 3,665,362.
Jackson, Wilbur F.; and Willson, James R., 3,664,582.
McIntosh, Harold A., 3,665,258.
Rosenberg, David M.; and Manecke, Siegfried E., 3,665,363.
Robertson, Melvin F.: *See*—
Maiste, Arved; and Robertson, Melvin F.,3,664,348.
Robertson, Walter C. Variable electric metronome. 3,664,225, Cl. 84-484.
Robinson, Charles C.; and Snitzer, Elias, to American Optical Corporation. Photochromic glass. 3,664,725, Cl. 350-160.00p
Robinson, Frank: *See*—
Betts, Max W.; and Robinson, Frank,3,664,156.
Robinson, Thomas, to Antoma (Hairdressing) Company Limited. Drive apparatus for print rollers for printing machinery. 3,665,275, Cl. 318-261.000
Rockey, Robert E.: *See*—
Mullersman, Ferdinand H.; and Rockey, Robert E.,3,665,285.
Rodenko, Fedor Leontievich: *See*—
Tatianko, Nikolai Vasilievich; Tsymbal, Alexandr Gavrilovich; Stetsenko, Vladimir Vasilievich; Isikov, Sergei Alexandrovich; Rodenko, Fedor Leontievich; Betcher, Alexandr Samuilovich; Shamrai, Petr Dmitrievich; Dulya, Mikhail Afanasievich; Dudka, Viktor Vasilievich; Klimchuk, Ivan Petrovich; and Dolgov, Anatoly Mikhailovich,3,664,431.
Roederer, Charles: *See*—
Dumont-Fillon, Jacques; and Roederer, Charles,3,665,085.
Roesch, Egon: *See*—
Popelak, Alfred; Lerch, Ansgar; Stach, Kurt; Roesch, Egon; and Hardebeck, Klaus,3,665,002.
Rogers, Charles J., Sr.; and Stanley, Paul E. Electrical protective circuit. 3,665,252, Cl. 317-18.
Rogers, George L.: *See*—
Bakel, Joseph F.; and Rogers, George L.,3,665,170.
Rogers, Howard H.: *See*—
Greyson, Jerome; and Rogers, Howard H.,3,664,940.
Rogers, John A.; and Bossard, Fredrick R., to Standard Engineering Co., Inc., mesne. Vehicle rear wheel drive assembly. 3,664,451, Cl. 180-70.
Rogers, Roland T.: *See*—
Gross, Robert D.; and Rogers, Roland T.,3,665,426.
Rohr Corporation: *See*—
Duvvuri, Tirumalesa, 3,664,455.
Rohrig, Klaus: *See*—
Kraemer, Friedrich; Mandel, Jorn; Mayer, Siegfried; Rohrig, Klaus; Schulz, Hans-Peter; Weidenmuller, Hilmar; Haverkamp, Klaus Dieter; and Motz, Jurgen,3,664,826.
Roland Offsetmaschinenfabrik Faber & Schleicher AG: *See*—
Eibe, Helmut, 3,664,408.
Rolls-Royce Limited: *See*—
Cuckson, Kenneth; and Chapman, Gerald W., 3,664,900.
Romer, Bendt Wegge: *See*—
Knudsen, Jorgen Dahlman; Romer, Bendt Wegge; and Valbjorn, Knud Vagn,3,664,769.
Leffers, Hans Ulrik; Romer, Bendt Wegge; and Valbjorn, Knud Vagan,3,664,461.
Romnas Burks Aktiebolag: *See*—
Camitz, Carl-Henning, 3,664,121.
Rose, Millard F.; and Talley, James C., to United States of America, Navy. Reactive focusing warhead concept. 3,664,262, Cl. 102-56.000
Rose, William Henry: *See*—
Lockard, Joseph Larue; and Rose, William Henry,3,665,127.
Rosenberg, David M.; and Manecke, Siegfried E., to Robertshaw Controls Company. Thermostatic control device and system utilizing the same. 3,665,363, Cl. 337-361.
Rosenfeld, Seymour: *See*—
Haucke, Paul A.; Rosenfeld, Seymour; Schwab, Ronald W.; and Mazzeo, Charles F.,3,664,173.
Rosser, Eugene P.; and Lorenz, Howard I., said Rosser assor. to Noble Drilling Corporation. Underwater pipe positioning apparatus. 3,664,442, Cl. 175-231.
Rossler, Kurt: *See*—
Schweigert, Luitpold; and Rossler, Kurt,3,664,592.
Rotary Profile Anstalt: *See*—
Marcovitch, Jacob, 3,663,977.
Roth, John Paul: *See*—
Bouricius, Willard Gail; Carter, William Caswell; Roth, John Paul; and Schneider, Peter Robert,3,665,418.
Bouricius, Willard G.; Carter, William C.; Duke, Keith A.; Roth, John P.; and Schneider, Peter R.,3,665,174.
Bouricius, Willard G.; Carter, William C.; Roth, John P.; and Schneider, Peter R.,3,665,173.
Bouricius, Willard G.; Carter, William C.; Roth, John P.; and Schneider, Peter R.,3,665,175.
Rotheiser, Jordan I., to Central Specialties Co. Wheel wedge. 3,664,466, Cl. 188-32.
Rousseau, Roy S.; Keating, Raymond J.; and Steinke, Gary L., to Kartridge-Pak Co., The. Packaging machine. 3,664,085, Cl. 53-112.
Rowland-Hill, Edward William, to Sperry Rand Corporation. Axial combine with rotor and concave convertible to support different threshing elements. 3,664,100, Cl. 56-14.600
Royle, Joseph Kenneth; Grant, John; and Golder, Jack Alexander, to United Kingdom Atomic Energy Authority. Fluid flow control devices. 3,664,360, Cl. 137-81.500
Roza, Engel; Benning, Herman J.G.M.; and Lommers, Anthonius J.J.C.L., to U.S. Philips Corporation. Self-oscillating voltage converter. 3,665,344, Cl. 331-116.00r
Rozmus, Walter J., to Kelsey-Hayes Company. Cold butt welding machine. 3,664,566, Cl. 228-3.
Ruben, Mara Khugovna: *See*—
Khusid, Iosif Efimovich; Bezgodova, Ljudmila Ivanovna; and Ruben, Mara Khugovna,3,664,999.
Rubery, Owen & Co. Limited: *See*—
Hawkins, John C., 3,663,987.
Rucker Company, The: *See*—
Douglas, Ellwood S.; and Wahlgren, Wallace W., 3,665,356.
Rudd, Harry M.: *See*—
Paris, Ray J.; and Rudd, Harry M.,3,665,376.
Rudolph, Hans: *See*—
Fuhr, Karl; Vernaleken, Hugo; Heine, Hans-Georg; Rudolph, Hans; and Schnell, Hermann,3,664,937.
Ruegg, Rudolf; and Schmialek, Peter, to Hoffmann-La Roche Inc. Pesticides. 3,665,040, Cl. 260-614.
Ruegg, Rudolf; and Schwieter, Ulrich, to Hoffman-La Roche, Inc. Unsaturated aldehydes. 3,665,039, Cl. 260-602.
Ruehl, Herbert T.: *See*—
Hazlewood, John F.; and Ruehl, Herbert T.,3,664,075.
Ruhland, Walter F.: *See*—
Mills, Albert D.; and Ruhland, Walter F.,3,664,776.
Runzi, Kurt. Device for feeding flat objects to a processing machine. 3,664,660, Cl. 271-35.000

Rupert, Samuel J.; and Ziegler, William E., to Hoover Ball and Bearing Company. Method for blow molding hollow articles in minimum cycle time. 3,665,063, Cl. 264-89.000

Ruppert, Albert L., to Oak Electro/Netics Corporation. Linear prism display. 3,664,047, Cl. 40-28.

Ruskin, Asa P. Closure plug. 3,664,541, Cl. 220-42.00b

Russell, Frederick, to Brown and Williamson Tobacco Corporation. Cigarette-making machinery. 3,664,351, Cl. 131-110.

Russell, Joseph L., to Halcon International, Inc. Process for preparation of borate esters. 3,665,028, Cl. 260-462.

Ruth, Arthur P.: *See—*
Kelsey, Newton D., 3,665,224.

Rutkowski, Karl: *See—*
Gerke, Peter; Rutkowski, Karl; Bock, Helmuth; and Palsa, Helmut,3,665,110.

Rybar, Clement S.: *See—*
Petros, Andrew J.; and Rybar, Clement S.,3,664,518.

Ryland, Peter M., to Pitney-Bowes, Inc. Collator having gather actuated control. 3,664,656, Cl. 270-58.000

Ryzhevskaya, Tamara Nikolaevna: *See—*
Bogoroditsky, Alexandr Alexandrovich; Ryzhevskaya, Tamara Nikolaevna; Ryzhevsky, Alexei Gordeevich; and Shlyandin, Viktor Mikhailovich,3,665,456.

Ryzhevsky, Alexei Gordeevich: *See—*
Bogoroditsky, Alexandr Alexandrovich; Ryzhevskaya, Tamara Nikolaevna; Ryzhevsky, Alexei Gordeevich; and Shlyandin, Viktor Mikhailovich,3,665,456.

Saab-Scania Aktiebolag: *See—*
Goransson, Nils Paul, 3,664,187.

Saam, John C.; and Fearon, Frederick W. G., to Dow Corning Corporation. Method of preparing a block copolymer containing a poly-alpha-methylstyrene block and a polydiorganosiloxane block. 3,665,052, Cl. 260-827.000

Sack, Ernst Theodor, to Maschinenfabrik Sack GmbH. Roller tables. 3,664,167, Cl. 72-251.

Saeli, John J.: *See—*
Goode, John P.; Saeli, John J.; and Sformo, James P.,3,665,372.

Safariland Ltd., Inc.: *See—*
Perkins, Neale A., 3,664,560.

Sagara, Kazuo: *See—*
Fujii, Masaru; Sagara, Kazuo; and Isomura, Shuichi,3,665,276.

Sahakian, Vahak K., to Fairchild Camera and Instrument Corporation. High speed automatic sequential tester-handler. 3,664,499, Cl. 209-73.000

Saikawa, Hisashi: *See—*
Sasaki, Kenkichi; and Saikawa, Hisashi,3,665,355.

Saito, Noboru, to Nitto Kohki Company Limited. Apparatus for adjusting the position of the axis of a belt supporting pulley. 3,664,208, Cl. 74-242.150

Saito, Shigeru: *See—*
Sato, Shosuke; Saito, Shigeru; and Kobayashi, Saburo,3,665,309.

Saito, Tadashi; Shimada, Masaru; and Sakai, Koyoshi, to Kabushiki Kaisha Ricoh. Diazotype photoprinting material. 3,664,840, Cl. 96-91.

Sakabe, Akira; and Sugimoto, Kinji, to Hitachi, Ltd. Direct-current arc welder. 3,665,149, Cl. 219-131.

Sakaguchi, Mitsuhito: *See—*
Kiji, Kazuo; Nishida, Nobuo; and Sakaguchi, Mitsuhito,3,664,722.

Sakai, Asahi: *See—*
Clayton, David W.; and Sakai, Asahi,3,664,918.
Clayton, David W.; and Sakai, Asahi,3,664,919.

Sakai, Koyoshi: *See—*
Saito, Tadashi; Shimada, Masaru; and Sakai, Koyoshi,3,664,840.

Sala, Sergio; Cuneo, Ambrogio; and Dabisch, Wolfgang. Typewriter ribbons having correction coating and method of making. 3,664,869, Cl. 117-2.

Salem Equipment, Inc.: *See—*
Reed, Gaylard O., 3,664,395.

Salisbury, Robert E.; and Erickson, John W., to Preco, Inc. Stall control for vane axial compressors. 3,664,757, Cl. 415-53.

Sallee, Gary F.: *See—*
Owens, John M.; and Sallee, Gary F.,3,665,211.

Samietz, Klaus P.; Wamser, Anton; and Weingartner, Ernst F., to Leybold-Heraeus GmbH & Co. Consumable electrode vacuum furnace. 3,665,084, Cl. 13-31.

Sanders Associates, Inc.: *See—*
Gabor, William D., 3,665,126.
Greenspan, Lawrence E.; and Whitaker, Earl J., 3,665,402.
Miller, Howard S.; and Shooman, William, 3,665,409.
Stoddard, Robert D.; Schumacher, Arnold; Conley, Grant W.; and Williams, Roy M., Jr., 3,665,454.

Sanders, James S., to Skid-Stack Corporation. Stackable pallet constructions. 3,664,272, Cl. 108-53.000

Sanders, Ray W.; Keyes, Neil T.; and Quan, William, to Computer Transmission Corporation. Multiplexer. 3,665,405, Cl. 340-172.5

Sandlin, Billy J.: *See—*
Hubbuch, Theodore; Murfree, James A., Jr.; Duncan, William A.; Sandlin, Billy J.; and Nappier, Henry A.,3,664,969.

Sandvikens Jernverks Aktiebolag: *See—*
Bergqvist, Mats Soren; Kallstrom, Olof Krister; Lagerberg, Per Goran Olof; and Okvist, Nils Axel Gunnar, 3,664,825.

Sanford, Norman R., to Bendix Corporation, The. Electrical apparatus and gaging device using same. 3,665,506, Cl. 324-103.00p

Sankus, Joseph G.: *See—*
Amidon, Alan B.; Sankus, Joseph G.; Petruzzella, Nicholas L.; and Ewing, Joan R.,3,664,834.

Sano, Kenji: *See—*
Murakami, Masuo; Iwanami, Masaru; Kubo, Kazuo; Sano, Kenji; Kochiya, Masahiro; and Arima, Hideki,3,665,037.

Santomieri, Louis S. Drip chamber and method. 3,664,339, Cl. 128-214.

Saraceno, Anthony J.; Walters, Reed H.; Jones, Donald B.; and Wiehle, William E., to United States of America, Atomic Energy Commission. Process for selective removal and recovery of chromates from water. 3,664,950, Cl. 210-35.000

Sarbacher, Robert I., to Bogue, John S. Self powered refrigerated disposable container. 3,664,144, Cl. 62-3.

Sargeant, Archibald, to Wingard Limited. Inertia reels for safety belts. 3,664,600, Cl. 242-107.4

Sasaki, Kenkichi; and Saikawa, Hisashi, to Yamauchi Rubber Industry Co., Ltd. Cover for protecting coatings of automobiles and the like. 3,665,355, Cl. 335-306.

Sasseen, John H., to Esso Production Research Company. Automatic system for lifting magnetic tape from magnetic heads. 3,664,610, Cl. 242-210.000

Sato, Masatoshi: *See—*
Hirokawa, Yoichi; and Sato, Masatoshi,3,665,289.

Sato, Mikio: *See—*
Nakanishi, Atsuo; Izawa, Shinichi; and Sato, Mikio,3,664,977.

Sato, Ryuichi, to Nikkiso Co., Ltd. Axial thrust balancing mechanism for motor driven pump. 3,664,758, Cl. 415-104.000

Sato, Shosuke; Saito, Shigeru; and Kobayashi, Saburo, to Kabushikikaisha Tokyo Keiki Seizosho (Tokyo Keiki Seizosho Co., Ltd.). Time interval measuring instrument. 3,665,309, Cl. 324-186.

Sato, Tadakazu, to Fujitsu Limited. Electrostatic recording apparatus for high speed operation. 3,665,486, Cl. 346-74.

Satovskaya, Ljudmila Sergeevna: *See—*
Shtin, Lev Mikhailovich; Grebnev, Nikolai Feodosovich; Satovskaya, Ljudmila Sergeevna; Rasseikin, Mikhail Grigorievich; Khirdzhiev, Sergei Grigorievich; Perevozchikov, Evgeny Titovich; Zagulina, Sofia Stepanovna; Duda, Vladimir Nikolaevich; and Karasev, Mikhail Andreevich,3,664,168.

Sauer, Walter Edwin; and Klemas, Vytautas, to General Electric Company. Liquid layer thickness device having a floating electrode. 3,665,300, Cl. 324-61.

Sauterel, Gerard; and Fornerod, Andre, to Matisa Materiel Industriel S.A. Process for the alignment of railway tracks. 3,664,265, Cl. 104-8.000

Savote, Hilbert J., Jr. Underwater pipeline-riser clamps for use on oil and gas pipelines. 3,664,621, Cl. 248-44.00r

Sawyer, Harold T., 20% to Beehler, Vernon D. Knife. 3,664,021, Cl. 30-272.

Scanlon, Robert M.; and Beckwith, Hildreth C., to Granco Equipment, Inc. Conveyor slat construction. 3,664,491, Cl. 198-195.

Scappatura, Rocco: *See—*
Glatzer, Stephen G.; and Scappatura, Rocco,3,665,315.

Scarlett, Wallace W.: *See—*
Fritze, William R.; and Scarlett, Wallace W.,3,664,009.

Schaad, William J.; and Schmidt, Fred N., to Indak Manufacturing Corporation. Electrical switch having rotary and push actions. 3,665,128, Cl. 200-44.

Schaefer, Donald L.; and Wilson, Ronald H., to General Electric Company. Method of forming a camera tube diode array target by masking and diffusion. 3,664,895, Cl. 148-187.

Schaefer, George J., Jr., to Kees, F. D., Manufacturing Co. Travelling sprinkler shut off. 3,664,367, Cl. 137-344.000

Schaeff, Friedrich. Axle suspension for automotive vehicles. 3,664,452, Cl. 180-71.

Schaeffer, Bruce S.: *See—*
Garland, Milton W.; and Schaeffer, Bruce S.,3,664,149.

Schaffner, Myer J., to E-Z Serv, Inc. Remote controlled oil and liquid drain valve. 3,664,633, Cl. 251-294.000

Schagen, Pieter, to U.S. Philips Corporation. Multi-colored stereoscopic X-ray imaging and display systems. 3,665,184, Cl. 250-60.

Schaper, Hans; Springer, Kurt; and Kyburz, Edgar, to Swiss Aluminium, Ltd. Crust breaker for aluminum fusion electrolysis cells. 3,664,946, Cl. 204-243.00r

Scharkowitz, Eckhart, to Siemens Aktiengesellschaft. Buffer store with a control circuit for each stage. 3,665,424, Cl. 340-173.

Scheinpflug, Hans: *See—*
Buchel, Karl Heinz; Regel, Erik; Grewe, Ferdinand; Scheinpflug, Hans; and Kaspers, Helmut,3,665,076.
Buchel, Karl-Heinz; Regel, Erik; Grewe, Ferdinand; Scheinpflug, Hans; and Kaspers, Helmut,3,665,077.
Buchel, Karl-Heinz; Regel, Erik; Grewe, Ferdinald; Scheinpflug, Hans; and Kaspers, Helmut,3,665,078.
Buchel, Karl-Heinz; Regel, Erik; Grewe, Ferdinand; Scheinpflug, Hans; and Kaspers, Helmut,3,665,079.

Schering Corporation: *See—*
Teutsch, George J.; and Shapiro, Elliot L., 3,665,017.

Schettl, Myron D.: *See—*
Igel, John J.; and Schettl, Myron D.,3,665,403.

Scheuer, Fred F., to Dustikin Products, Inc. Cleaning and polishing paper and method of making same. 3,664,064, Cl. 51-402.

Schich, Karl. Apparatus for hot-water and heating installations. 3,664,373, Cl. 137-565.

Schiele, Gert: *See—*
Jakszt, Werner; Schiele, Gert; and Werner, Wolfgang,3,665,255.

Schieser, Warren J. Telephone use monitor and signalling apparatus. 3,665,111, Cl. 179-81.00c

Schiewek, Peter; and Kremper, Dieter, to Siemens Aktiengesellschaft. Method and system for digital subdivision of the tool feed travel of a numerically controlled machine tool. 3,664,217, Cl. 83-49.

Schiffmann, Robert F.; Stein, Ernest W.; and Kaufman, Harold B., Jr., to DCA Food Industries, Inc. End trap for microwave oven. 3,665,141, Cl. 219-10.55

Schindelbeck, Fritz H.: *See—*
Leuck, Carl A.; and Schindelbeck, Fritz H.,3,665,358.

Schlage, Ernest L., to Schlage Lock Company. Cylinder loading tool. 3,664,007, Cl. 29-271.

Schlage Lock Company: *See—*
Schlage, Ernest L., 3,664,007.

Schleupen, Richard: *See—*
Junker, Jurgen; and Schleupen, Richard,3,664,945.

Schlimgen, Lawrence: *See—*
Zehr, Richard M.; Mott, James; and Schlimgen, Lawrence,3,665,399.

Schlumberger Technology Corporation: *See—*
Nicolas, Yves; and Bonnet, Jean-Loup, 3,664,416.
Urbanosky, Harold J., 3,664,421.

Schmersal, Larry J.; Miavecz, Joseph L.; Pierce, Edward W.; and Wojcik, David S., to Owens-Illinois, Inc. Binary addressable magnetically multiplex discharge manipulation system for multiple gaseous discharge display/memory panel. 3,665,455, Cl. 340-343.

Schmialek, Peter: *See—*
Ruegg, Rudolf; and Schmialek, Peter,3,665,040.

Schmid, Julius, Inc.: *See—*
Gordon, Harry W., 3,664,341.

Schmidlin, Raymond J.: *See—*
Miller, Donald J.; and Schmidlin, Raymond J.,3,664,260.

Schmidt, Fred N.: *See—*
Schaad, William J.; and Schmidt, Fred N.,3,665,128.

Schmoyer, Arthur R.: *See—*
Boswell, John E. E., Jr.; and Miner, Jesse H., 3,664,036.

Schneider, Peter R.: *See—*
Bouricius, Willard G.; Carter, William C.; Roth, John P.; and Schneider, Peter R.,3,665,173.
Bouricius, Willard G.; Carter, William C.; Duke, Keith A.; Roth, John P.; and Schneider, Peter R.,3,665,174.
Bouricius, Willard G.; Carter, William C.; Roth, John P.; and Schneider, Peter R.,3,665,175.
Bouricius, Willard Gail; Carter, William Caswell; Roth, John Paul; and Schneider, Peter Robert,3,665,418.

Schneider, William E., to United States of American, Navy. Resilient poppet valve. 3,664,371, Cl. 137-516.290

Schnell, Hermann: *See—*
Fuhr, Karl; Vernaleken, Hugo; Heine, Hans-Georg; Rudolph, Hans; and Schnell, Hermann,3,664,937.

Schnettler, Richard A.: *See—*
Suh, John T.; and Schnettler, Richard A.,3,665,006.

Schobel, Karl; and Becker, Werner, to Messer Griesheim GmbH. Device for electrical protective gas welding. 3,665,147, Cl. 219-131.

Schoen, Kurt, to Contraves AG. Conductivity cell for particle counting apparatus. 3,665,295, Cl. 324-30.00b

Scholten Research N.V.: *See—*
Dijkhuizen, Willem; and Beersma, Pieter Johannes Adrianus, 3,664,863.

Schomer, Raymond A.: *See—*
Yasenchak, Richard W.; Schomer, Raymond A.; and Harper, Ernest V.,3,665,148.

Schonegg, Louis E.: *See—*
Hoffman, Stephen J.; and Schonegg, Louis E.,3,665,318.

Schormann, Urmas: *See—*
Smith, James W., Sr.; Evans, Benjiman E.; Riggles, William M., Jr.; and Schormann, Urmas,3,664,456.

Schrade, Hans Christoph; Del Giudice, William F.; and Wimer, Charles W., to Howes Leather Company, Inc. Leather rolling apparatus. 3,664,162, Cl. 69-46.000

Schubert, Alfred: *See—*
Schubert, Bernhard; Schubert, Alfred; and Berlin, Herbert,3,664,891.

Schubert, Bernhard; Schubert, Alfred; and Berlin, Herbert, to Hauni-Werke Korber & Co., KG. Apparatus for assembling rows of rod-shaped articles. 3,664,891, Cl. 198-31.

Schuler, Karl: *See—*
Dietrich, Hermann; Schuler, Karl; and Meese, Heinz Gunter,3,665,352.

Schulz, Hans-Peter: *See—*
Kraemer, Friedrich; Mandel, Jorn; Mayer, Siegfried; Rohrig, Klaus; Schulz, Hans-Peter; Weidenmuller, Hilmar; Haverkamp, Klaus Dieter; and Motz, Jurgen,3,664,826.

Schumacher, Arnold: *See—*
Stoddard, Robert D.; Schumacher, Arnold; Conley, Grant W.; and Williams, Roy M., Jr.,3,665,454.

Schuster, Wilhelm August, to Filztuchverwaltungs-Gesellschaft mit beschrankter Haftung, mesne. Non-woven needled fibrous structure. 3,664,905, Cl. 161-59.000

Schwab, Delmar G., to Hyster Company. Hydraulic cooling system. 3,664,129, Cl. 60-53.

Schwab, Ronald W.: *See—*
Haucke, Paul A.; Rosenfeld, Seymour; Schwab, Ronald W.; and Mazzeo, Charles F.,3,664,173.

Schwan, Thomas J.: *See—*
Burch, Homer A.; and Schwan, Thomas J.,3,665,032.

Schwartz, Gunter: *See—*
Brune, Werner; Schwartz, Gunter; Dull, Ernst Hermann; and Polly, Edgar,3,665,393.

Schwarz, Helmut J., to Research Corporation. Quadrupole ionization gauge. 3,665,245, Cl. 315-111.

Schwarzenbach, Kurt: *See—*
Peterli, Hans Jakob; Keller, Ernst; and Schwarzenbach, Kurt,3,665,031.

Schweigert, Luitpold; and Rossler, Kurt. Machine for granulating bulk rubbish or bulky refuse of any kind. 3,664,592, Cl. 241-73.

Schwieter, Ulrich: *See—*
Ruegg, Rudolf; and Schwieter, Ulrich,3,665,039.

Schwinn Bicycle Company: *See—*
Fritz, Albert J.; and Schwinn, Rudolph L., 3,664,027.

Schwinn, Rudolph L.: *See—*
Fritz, Albert J.; and Schwinn, Rudolph L.,3,664,027.

Scientific Security Systems, Incorporated: *See—*
Riley, Robert E., Jr., 3,665,445.

Scott & Fetzer Company, The: *See—*
Burgoon, Jack L., 3,663,985.

Scott, E. Walter: *See—*
Tucker, Council A., 3,664,073.

Scott, Herbert W., to Gilbey Equipment Ltd. Wire forming machine. 3,664,384, Cl. 140-92.940

Scott, Hugh D., to Simplimatic Engineering Co. Missing container detector having integrated circuit modules. 3,665,444, Cl. 340-259.

Scott, Kenneth A., to Sun Oil Company. Fractionation of C_{12} bicyclic aromatic hydrocarbons by 2-chloro, 4-nitrobenzoic acid complex formation. 3,665,044, Cl. 260-674.00n

Scott, Kenneth A.: *See—*
Davis, Ronald I.; and Scott, Kenneth A.,3,665,043.
Davis, Ronald I.; and Scott, Kenneth A.,3,665,045.

Scott, Walter L. Occupant propelled rotating swing. 3,664,665, Cl. 272-33.00r

Scovill Manufacturing Company: *See—*
Passaggio, Charles, 3,664,377.

Scruggs, James A., to United States of America, Army, mesne. Preparation of aluminum hydride by hydrogenation of aluminum in presence of a dialkyl aluminum hydride. 3,664,811, Cl. 23-204.

Sea-Land Service, Inc.: *See—*
Shahani, Prakash W., 3,664,539.

Searle, John Albert; and Perrin, Dennis William, to Motor Industry Research Association. Human simulations (dummies). 3,664,038, Cl. 35-17.

Searle, Robert F.: *See—*
Hendershot, James R., Jr.; and Searle, Robert F.,3,664,473.

Seaton, William Joe; and Pratt, Arnold T., to Garside Corporation. Alarm system. 3,665,462, Cl. 343-5.0pd

Seatrain Lines, Inc.: *See—*
Frankel, Ernst G., 3,664,388.

Secondo Dalporte, and: *See—*
Barnett, Elben Ray; and Barnett, Raymond Ray, 3,665,203.

Seeburg Corporation of Delaware, The: *See—*
Jachimek, Thomas P.; and Wrabel, James A., 3,665,208.

Seeley, Harvey E., Jr., to American Pollution Controlled, Inc. Method and apparatus for mixing and metering fuel in an internal combustion engine. 3,664,648, Cl. 261-41.

Seelinger, Richard W., to Ovitron Corporation. Package steam generator. 3,664,309, Cl. 122-336.

Seguin, Pierre, to Moulinage et Retorderie de Chavanoz. High-strength non-extensible conductive wire. 3,665,095, Cl. 174-107.

Sehnert, Robert J.: *See—*
Higgason, Frank G., Jr.; and Sehnert, Robert J.,3,664,577.

Seidlitz, Raymond R., to Teletype Corporation. Selective drive mechanisms. 3,664,471, Cl. 192-4.00r

Seitz, Joseph R. M., to Whole Earth Corporation, The. Combustion system. 3,664,134, Cl. 60-274.

Sekine, Kenji; and Kaneko, Yoichi, to Hitachi, Ltd. Temperature compensated cavity for a solid state oscillator. 3,665,341, Cl. 331-107.

Seko, Maomi; Yomiyama, Agira; Takahashi, Yasunobu; Seta, Shigetoshi; and Nakagawa, Koji, to Asahi Kasei Kogyo Kabushiki Kaisha. Electrolytic hydrodimerization of acrylonitrile. 3,664,936, Cl. 204-73.

Selas Corporation of America: *See—*
Jordan, George V., 3,664,507.

Selby, Jack H., to Warner & Swasey Company, The. Machine tool with bar stock gripper. 3,664,215, Cl. 82-2.5

Seleznev, Georgy Vasilievich: *See—*
Orlova, Frida Abramovna; Seleznev, Georgy Vasilievich; and Bonjuk, Petr Veniaminovich,3,664,885.

Sen Electronique: *See—*
Gutmann, Johanes, 3,665,188.

Sennowitz, Kurt H., to Elox, Inc. Electrical discharge machining power supply with protective system for output switch failure. 3,665,144, Cl. 219-69.

Serck Industries Limited: *See—*
Walton, Peter, 3,664,235.

Sertna, Societe d'Etudes et de Recherches de Techniques Nouvelles Appliquees S.A.:*See*—
Meunier, Renee J. Louise; and Marmonier, Monique Adele, 3,664,506.

Seta, Shigetoshi: *See*—
Seko, Maomi; Yomiyama, Agira; Takahashi, Yasunobu; Seta, Shigetoshi; and Nakagawa, Koji,3,664,936.

Sevc, John M.; and Pierce, Howard E., Jr., to Litton Systems, Inc. Apparatus and method for aligning a plurality of connector mounted pins by deformation and reformation thereof. 3,664,016, Cl. 29-628.

Sexauer, Richard F. Removable self-jetting pile. 3,664,139, Cl. 61-53.74

Sformo, James P.: *See*—
Goode, John P.; Saeli, John J.; and Sformo, James P.,3,665,372.

Shaffer, John W.; and McDonough, Thomas B., to GTE Sylvania Incorporated. Photographic flashlamp unit. 3,665,176, Cl. 240-1.300

Shaffer, William E., to Stromberg-Carlson Corporation. Pulsing circuit including a series switching circuit. 3,665,109, Cl. 179-16.00e

Shahani, Prakash W., to Sea-Land Service, Inc. Tarpaulin tie down assembly for open top containers. 3,664,539, Cl. 220-24.000

Shaler, David; and Varrichio, Ralph A., to EG&G, Inc., mesne. Electrostatic recording paper toner section. 3,664,299, Cl. 118-637.000

Shamrai, Petr Dmitrievich: *See*—
Tatianko, Nikolai Vasilievich; Tsymbal, Alexandr Gavrilovich; Stetsenko, Vladimir Vasilievich; Isikov, Sergei Alexandrovich; Rodenko, Fedor Leontievich; Betcher, Alexandr Samuilovich; Shamrai, Petr Dmitrievich; Dulya, Mikhail Afanasievich; Dudka, Viktor Vasilievich; Klimchuk, Ivan Petrovich; and Dolgov, Anatoly Mikhailovich,3,664,431.

Shane, Berwyn E., to Pacific Associated Lighting, Inc. Hinge. 3,663,990, Cl. 16-178.000

Shapiro, Elliot L.: *See*—
Teutsch, George J.; and Shapiro, Elliot L.,3,665,017.

Shaw, Frank Donald. Battery of cells and means of assembly. 3,664,877, Cl. 136-171.

Shaw, James L.: *See*—
Hild, Henry F.; Manecke, Siegfried E.; and Shaw, James L.,3,665,362.

Shaw, Walter, to French, Thomas & Sons Limited. Dish washing machines. 3,663,979, Cl. 15-74.

Shea, James J.; and Ochodnicky, Samuel S., to Gam Rad, Inc. Turbidimeter utilizing back scatter. 3,665,201, Cl. 250-218.

Shell Oil Company: *See*—
Ayers, Ray R.; Titus, Paul E.; and Hanson, James R., 3,664,504.
Evans, Charles C.; and Sommer, Harry J., 3,664,856.
Spaargaren, Klaas; and Bijl, Aart, 3,665,172.

Shelley, George R. Plate separator for self-leveling plate dispensers. 3,664,546, Cl. 221-279.

Shema, Bernard F.; Brink, Robert H., Jr.; and Swered, Paul, to Betz Laboratories, Inc. Slimicidal composition and its use. 3,664,821, Cl. 71-67.000

Sherman, Allen Butman, to Ritchie, E. S., & Sons, Inc. Magnetic compass tack heading indicator. 3,664,292, Cl. 116-114.000

Sherman, Earle C., to Olinkraft, Inc. Package forming apparatus. 3,664,088, Cl. 53-180.000

Sherman, Gale K., to McDonnell Douglas Corporation. Pilot support. 3,664,598, Cl. 242-107.300

Sherrill, John F. Fluid pressure vehicle jack. 3,664,636, Cl. 254-93.0hp

Sherwood, Richard Curry: *See*—
Bobeck, Andrew Henry; Sherwood, Richard Curry; and Van Uitert, Le Grand Gerard,3,665,427.

Shibanova, Olga Mikhailovna: *See*—
Petrov, Gennady Nikolaevich; Lisochkin, Grigory Fedorovich; Shmagin, Valentin Parmenovich; and Shibanova, Olga Mikhailovna,3,664,989.

Shilnikova, Albina Georgievna: *See*—
Menyailo, Anatoly Tikhonovich; Pospelov, Mikhail Valerievich; Kaliko, Olga Romanovna; Pokrovskaya, Inna Evgenievna; Fedorova, Valentine Vsevolodovna; Shilnikova, Albina Georgievna; Yakovleva, Antonina Karpovna; and Narozhenko, Tamara Georgievna,3,664,810.

Shimada, Masaru: *See*—
Saito, Tadashi; Shimada, Masaru; and Sakai, Koyoshi,3,664,840.

Shimizu, Junichi; and Kaga, Toshio, to Hokkaido Sugar Company, Ltd. Apparatus for continuous hydrolysis of raffinose. 3,664,927, Cl. 195-141.

Shimizu, Soichiro. Building-slip having a resilient supporting member. 3,664,140, Cl. 61-64.000

Shinkai, Takuo: *See*—
Kawai, Hidetoshi; Iizuka, Hajime; Shinkai, Takuo; and Yoshioka, Yoshiro,3,665,398.

Shinohara, Takashi: *See*—
Kamiya, Nobuyuki; Funada, Kiyotaka; Shinohara, Takashi; and Imai, Hiroko,3,664,860.

Shionogi & Co., Ltd.: *See*—
Kondo, Eiji; and Mitsugi, Takashi, 3,665,022.

Shiozawa, Daiichi, to Dai Nippon Insatsu Kabushiki Kaisha. Container for sprinkling powdered or granular materials. 3,664,554, Cl. 222-183.000

Shirshov, Vladimir Grigorievich: *See*—
Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Bondarenko, Oleg Petrovich; Latash, Jury Vadimovich; Baglai, Vitaly Mikhailovich; and Shirshov, Vladimir Grigorievich,3,665,488.

Shlyandin, Viktor Mikhailovich: *See*—
Bogoroditsky, Alexandr Alexandrovich; Ryzhevskaya, Tamara Nikolaevna; Ryzhevsky, Alexei Gordeevich; and Shlyandin, Viktor Mikhailovich,3,665,456.

Shmagin, Valentin Parmenovich: *See*—
Petrov, Gennady Nikolaevich; Lisochkin, Grigory Fedorovich; Shmagin, Valentin Parmenovich; and Shibanova, Olga Mikhailovna,3,664,989.

Shooman, William: *See*—
Miller, Howard S.; and Shooman, William,3,665,409.

Short, Ralph H., to Clark Equipment Company, mesne. Material handling apparatus. 3,664,527, Cl. 214-138.

Shtin, Lev Mikhailovich; Grebnev, Nikolai Feodosovich; Satovskaya, Ljudmila Sergeevna; Rasseikin, Mikhail Grigorievich; Khirdzhiev, Sergei Grigorievich; Perevozchikov, Evgeny Titovich; Zagulina, Sofia Stepanovna; Duda, Vladimir Nikolaevich; and Karasev, Mikhail Andreevich. Horizontal hydraulic press for tubular articles. 3,664,168, Cl. 72-265.

Shulman, Arthur; and Bonis, Henry M., Jr., to Nabs Leasing Corporation. Material feeding guide system for industrial sewing machinery. 3,664,281, Cl. 112-20.

Shultz, William S.: *See*—
Winget, Clifford L.; Gibson, George W.; and Shultz, William S.,3,664,438.

Shun-ichi, Kawasaki: *See*—
Kambayashi, Akira; Shun-ichi, Kawasaki; and Ehara, Takashi,3,664,830.

Shur-Lift Trailer & Manufacturing Co.: *See*—
Stephens, James M.; and Tallman, Erven, 3,664,459.

Sianesi, Dario; and Fontanelli, Renzo, to Montecatini Edison S.p.A. Perfluorinated polyethers and process for their preparation. 3,665,041, Cl. 260-615.

Sibley, Joseph F., to Pennwalt Corporation. Compacting press. 3,664,784, Cl. 425-78.

Sickel, Hans-Werner, to Hesterberg, F., & Sohne, Firma. Turning bolt locking device for transport vehicles. 3,664,695, Cl. 292-54.000

Sieber, Paul. Pulse generator. 3,665,207, Cl. 307-106.

Siemens Aktiengesellschaft: *See*—
Behn, Reinhard; Preissinger, Karl-Heinz; and Simson, Reiner, 3,665,268.
Bochmann, Karlheinz, 3,665,395.
Brandt, Fritz; and Ernst, Wolfram, 3,665,510.
Freller, Helmut; and Obitz, Magdalena, 3,665,366.
Gerke, Peter; Rutkowski, Karl; Bock, Helmuth; and Palsa, Helmut, 3,665,110.
Jakszt, Werner; Schiele, Gert; and Werner, Wolfgang, 3,665,255.
Scharkowitz, Eckhart, 3,665,424.
Schiewek, Peter; and Kremper, Dieter, 3,664,217.
Steggewentz, Hermann, 3,665,139.
Strelow, Alfred; and Hascher, Klaus, 3,664,108.
Zaubitzer, Richard, 3,665,200.

Sienkiewicz, Joseph E.: *See*—
Brown, Milton G.; Ollinger, James C.; and Sienkiewicz, Joseph E.,3,665,177.

Sierra Research Corporation: *See*—
Michnik, Lewis; and Tapply, William G., 3,665,321.

Siklos, Gregory, to Marbelite Company, Inc., The. Vehicle detection apparatus. 3,665,382, Cl. 340-38.

Silliman, Robert M., to Electronics Research, Inc. Omnidirectional tower supported antenna. 3,665,479, Cl. 343-726.

Silverman, Herbert William, to RCA Corporation. Checking an automatic testing system. 3,665,504, Cl. 324-26.000

Simms Motor Units Limited: *See*—
Skinner, Jack; and Whitehurst, George, 3,664,317.

Simon, Horst, to Eastman Kodak Company. Camera shutter mechanism. 3,664,252, Cl. 95-62.

Simons, Gerald F.; Lynch, Frederick W.; and McKown, Gary C., to Sperry Rand Corporation. Digital electrohydraulic servo actuator. 3,664,234, Cl. 91-363.000

Simplimatic Engineering Co.: *See*—
Scott, Hugh D., 3,665,444.

Simson, Reiner: *See*—
Behn, Reinhard; Preissinger, Karl-Heinz; and Simson, Reiner,3,665,268.

Sinclair, Albert R.: *See*—
Graham, John W.; Kiel, Othar M.; Terry, William M.; and Sinclair, Albert R.,3,664,420.

Singer Company, The: *See*—
Carns, Leroy J., 3,664,755.
Gross, Robert D.; and Rogers, Roland T., 3,665,426.
Johnson, Dwight N., 3,664,369.
Magee, Edward F.; and Haube, Stephen G., 3,665,086.
McKnight, Robert A., 3,664,746.
Noller, Harry F.; and Morris, John C., 3,664,578.
Norman, Melvin H.; and Hawthorne, Nathaniel F., 3,664,597.
O'Connor, Daniel G., 3,665,411.
Stone, Thomas W., 3,664,017.
Taylor, Allen R., 3,665,476.
Townsend, Vernon R.; and Womeldorf, Waldo M., 3,665,102.
Trefzger, Edwin W.; and Crimmins, Bruce, 3,664,607.

Singer, Josef, to Farbenfabriken Bayer Aktiengesellschaft. Anthraquinone dyestuffs. 3,665,019, Cl. 260-374.

Sinker, Robert A.; and Williams, George L., to Hughes Aircraft Company. Electric power source. 3,665,226, Cl. 310-8.300

Sioui, Richard H.; and Cohen, Harvey M., to Norton Company. Resin bonded metalacoated diamond or cubic boron nitride abrasive tools containing an inorganic crystalline filler and graphite. 3,664,819, Cl. 51-295.000

Sitabkhan, Abdul N., to HTL Industries, Inc., mesne. Electrical monitor for fire extinguisher. 3,664,430, Cl. 169-23.

Sitz, Gilbert Carl: *See*—
Lau, Ralph Rupp; and Sitz, Gilbert Carl,3,664,218.

Skaathun, Olav; and Troope, Walter S., to Tedeco Textile Development Co. A/S. Apparatus for treatment of fabrics with liquid ammonia. 3,664,158, Cl. 68-5.

Skehan, Bernard J., to Hughes Aircraft Company. Scan control system. 3,665,282, Cl. 318-627.

Skid-Stack Corporation: *See*—
Sanders, James S., 3,664,272.

Skidmore, Wallace E.; Syltebo, Bjarne E.; and Viall, Wilton S., to Boeing Company, The. Aircraft engine variable highlight inlet. 3,664,612, Cl. 244-53.00b

Skinner, Jack; and Whitehurst, George, to Simms Motor Units Limited. Fuel injection controls for internal combustion engines. 3,664,317, Cl. 123-139.0bg

Slagel, Robert C., to Ashland Oil, Inc. Acrylic aminimides and polymers thereof. 3,664,990, Cl. 260-85.500

Slepp, Alice C.: *See*—
Boucher, Wilfred M.; Kurilla, John; and Slepp, Alice C.,3,664,335.

SLI Industries: *See*—
Lewis, Martyn A.; and Domin, Siegfried, 3,665,500.

Small, Irwin A. Drill guide for mandibular staple and staple construction. 3,664,022, Cl. 32-2.000

Smeins, Craig B.: *See*—
Arjani, Farouk D.; Campbell, Kenneth C.; and Smeins, Craig B.,3,664,479.

Smith, Bissell J.: *See*—
Stohrer, Charles E., Jr.; and Smith, Bissell J.,3,664,591.

Smith, David P.: *See*—
Goff, Robert F.; and Smith, David P.,3,665,182.

Smith, Donald C. Drawing device or apparatus. 3,664,028, Cl. 33-174.

Smith, Ernest A.: *See*—
Brand, John R.; and Smith, Ernest A.,3,665,088.

Smith, Francis Hughes, to Vickers Limited. Interferometer. 3,664,745, Cl. 356-113.

Smith, Irving. Self-erecting shadow box. 3,664,049, Cl. 40-124.1

Smith, James W., Sr.; Evans, Benjiman E.; Riggles, William M., Jr.; and Schormann, Urmas, to Wollard Aircraft Equipment, Inc. Conveyance servicing structure. 3,664,456, Cl. 182-62.5

Smith Kline Instruments, Inc.: *See*—
Liston, Max D., 3,664,744.

Smith, Lowell R.: *See*—
Speziale, Angelo; and Smith, Lowell R.,3,665,023.

Smith, Marjorie O. Hanger construction. 3,664,512, Cl. 211-113.000

Smith, Thomas Edward: *See*—
White, Arnold George; Smith, Thomas Edward; Work, Lyall Campbell; and Miller, Willard Wallace,3,664,929.

Smith, William O., Sr. Lubricant metering valve. 3,664,462, Cl. 184-7.

Smithcraft Corporation: *See*—
Kruger, Michael H., 3,664,615.

Smithe, F. L., Machine Company, Inc.: *See*—
Helm, Herbert W., 3,664,240.

Sneller, Lee J., to Valley Decorating Company, mesne. Bracket for mounting decorations on a building front. 3,664,626, Cl. 248-224.000

Snitzer, Elias: *See*—
Robinson, Charles C.; and Snitzer, Elias,3,664,725.

Snodgrass, Hugh E.; and Lauchlan, Robert L., to Uniroyal, Inc. Modified polyphenylene oxide resin compositions. 3,665,058, Cl. 260-889.

Snook, Richard K., to Diginetics Incorporated. Stenographic apparatus providing a magnetically recorded digitally encoded record. 3,665,115, Cl. 178-21.000

Snow, John F.; and Clough, Roy L., Jr., to Xodar Corporation. Aerating system. 3,664,647, Cl. 261-30.000

Snyder, Alan Howard, Jr.: *See*—
Pendergrass, Buford; Applequist, Quintin A.; and Snyder, Alan Howard, Jr.,3,664,717.

Snyder, James H., to Clark Equipment Company. Valveless hydraulic control. 3,664,126, Cl. 60-52.0hd

SOC. F.A.T.A. S.p.A.: *See*—
Di Rosa, Gaetano, 3,664,267.

Societa Italiana Telecomunicazioni Siemens S.p.A.: *See*—
Valbonesi, Giuseppe, 3,665,125.

Societa Rhodiaceta: *See*—
Grellier, Rene; and Guyot, Claude, 3,664,916.

Societe Alsacienne de Constructions: *See*—
Laval, Robert Louis Gustave, 3,665,471.

Societe Anonyme dite: L'Oreal:*See*—
Kalopissis, Gregoire; and Bugaut, Andree, 3,665,036.

Societe Anonyme Francaise du Ferodo: *See*—
Maurice, Jean, 3,664,469.

Societe Anonyme Poclain: *See*—
Gauchet, Yves M., 3,664,528.
Praddaude, Pierre A., 3,664,127.

Societe de Fabrication d'Instruments de Mesure (S.F.I.M.):*See*—
Donjon, Jacques, 3,665,496.

Societe d'Etudes et de Realisations Electroniques:*See*—
Bezu, Maurice, 3,664,748.

Societe Francaise de l'Electro-Resistance:*See*—
Maurice, Jean, 3,665,364.

Societe Nouvelle de Roulements: *See*—
Beauchet, Jean, 3,664,067.

Societe Rhodiaceda: *See*—
Grellier, Rene; and Guyot, Claude, 3,664,917.

Solartron Electronic Group Limited, The: *See*—
Wheable, Desmond, 3,665,457.

Solomon, Raymond, to Fairchild Camera and Instrument Corporation. Push-pull structure for solution epitaxial growth of III-V compounds. 3,664,294, Cl. 118-7.000

Somann, Gert, to Ferplas Industries Limited. Self-locking strap buckle. 3,663,995, Cl. 24-74.000

Somervell, James A., to Micromation Systems Inc. Color photography from cathode ray tubes and other radiating areas. 3,665,420, Cl. 340-172.5

Somerville Industries Limited: *See*—
Stamp, George Frederick; and Walker, Kenneth Allan, 3,664,296.

Sommer, Harry J.: *See*—
Evans, Charles C.; and Sommer, Harry J.,3,664,856.

Sonenberg, Martin; and Yamasaki, Nobuyuki. Clinically active bovine growth hormone fraction. 3,664,925, Cl. 195-29.

Sonnet Tool and Manufacturing Co.: *See*—
Sunderman, Elwin; and Hilliard, Merle, 3,664,677.

Sony Corporation: *See*—
Ohsawa, Mitsuo; and Mino, Shinziro, 3,665,320.

Sorbier, Pierre. Apparatus for molding articles from a paste like material. 3,664,797, Cl. 425-214.

Soriente, Alfonse J.: *See*—
Wapner, Stanley H.; and Soriente, Alfonse J.,3,664,003.

Sotome, Hiromi, to Nippon Gakki Seizo Kabushiki Kaisha. Loudspeaker having annular diaphragm with double voice coil. 3,665,124, Cl. 179-115.5 0

Southard, Charles V., to Lockheed Aircraft Corporation. Antiskid device. 3,664,464, Cl. 188-5.

Southern Cross Industries, Inc.: *See*—
Bustos, Rafael Thomas, 3,664,274.

S.p.A. Antonio Ferrari & Figli: *See*—
Ferrari, Giuseppe, 3,664,551.

Spaargaren, Klaas; and Bijl, Aart, to Shell Oil Company. Control of a process variable by a computer and a controller which replaces the computer. 3,665,172, Cl. 235-150.1

Spaderna, Conan Henry. Snap action electric switch. 3,665,131, Cl. 200-67.00b

Sparton Corporation: *See*—
Pierson, William D., 3,664,175.

Spence, Wayman R., to Stryker Corporation. Cushion structure. 3,663,973, Cl. 5-348.

Spencer, Dudley W. C. Horseshoe manufacture electrically resistive horseshoe and method of attachment. 3,664,428, Cl. 168-4.

Spencer-Mitchell Co., The: *See*—
Brody, Irwin L.; and Brody, Bruce S., 3,664,705.

Speransky, Jaroslav; and Cerny, Harry E., to Microdot, Inc. Electrohydraulic caliper disc brake. 3,665,232, Cl. 310-77.

Spergel, Philip; and Gaines, Stanley L., to Instrumentation Laboratory, Inc. Fluid handling apparatus. 3,664,178, Cl. 73-53.000

Sperry Rand Corporation: *See*—
Grey, Donald M., 3,664,519.
Hurlburt, Joseph C., 3,664,101.
Kartchner, Earl M.; Van Horn, Gary R.; and Wallace, Richard A., 3,665,472.
Pataki, Andrew B., 3,664,203.
Roberts, Arthur S.; and Craig, Orlyn W., 3,665,212.
Rowland-Hill, Edward William, 3,664,100.
Simons, Gerald F.; Lynch, Frederick W.; and McKown, Gary C., 3,664,234.
Stiefvater, Thomas L.; Greiner, James G.; Hale, John K.; and Waldrop, Thomas W., 3,664,105.

Speziale, Angelo; and Smith, Lowell R., to Monsanto Company. N-(4-nitrophenylsulfonyl)-N'-(chloro and/or nitro substituted benzoyl)ureas. 3,665,023, Cl. 260-397.7

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Spiess, Hansjorg: *See*—
Spiess, Gustav,3,665,272.

Spiess, Marianne: *See*—
Spiess, Gustav,3,665,272.

Spiess, Peter: *See*—
Spiess, Gustav,3,665,272.

Spiess, Walter: *See*—
Spiess, Gustav,3,665,272.

Spiess-Guttinger, Lina: *See*—
Spiess, Gustav,3,665,272.

Spieth, Rudolf. Device for measuring a cylindrical body. 3,664,692, Cl. 287-52.000

Spindt, Charles A.; and Heynick, Louis N., to Stanford Research Institute. Field ionizer and field emission cathode structures and methods of production. 3,665,241, Cl. 313-351.000

Spire, Etienne; and Karinthi, Pierre, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges

Claude. Method nd apparatus for the treatment of molten metal. 3,664,652, Cl. 266-34.00a

Spisz, Albert S.: *See—*
Dreimanis, Herbert V.; Spisz, Albert S.; Merlino, Eugene L., Jr.; and Ellis, Jonas,3,664,481.

Sprague Electric Company: *See—*
Acello, Salvatore J., 3,665,267.
Dunkl, Franz S., 3,665,261.

Springer, Kurt: *See—*
Schaper, Hans; Springer, Kurt; and Kyburz, Edgar,3,664,946.

Spropkay, George P., to Product Design & Manufacturing Corporation. Vehicle electric latch mechanism. 3,664,698, Cl. 292-201.000

Square D Company: *See—*
Beavitt, Alan Robert, 3,665,349.

Squibb, E. R., & Sons, Inc.: *See—*
Haney, Thomas A.; and Bruno, Gerald A., 3,664,964.
Haugwitz, Rudiger D.; and Narayanan, Venkatachala Lakshmi, 3,665,007.

Staar, S.A.: *See—*
Staar, Theophiel Clement Jozef Lodewijk, 3,665,117.

Staar, Theophiel Clement Jozef Lodewijk, to Staar, S.A. Tape cartridge apparatus including a silence responsive positioning control. 3,665,117, Cl. 179-100.1

Stach, Kurt: *See—*
Popelak, Alfred; Lerch, Ansgar; Stach, Kurt; Roesch, Egon; and Hardebeck, Klaus,3,665,002.

Stafford, Richard W.: *See—*
Chestnut, Benjamin F.; and Stafford, Richard W.,3,664,198.

Stahlgruber Otto Gruber & Co.: *See—*
Felden, Alois, 3,664,503.

Stalder, Herbert; and Pellaton, Jean, to Electrospin Corporation. Sliding radially-clamping fripper. 3,664,110, Cl. 57-77.300

Stamp, George Frederick; and Walker, Kenneth Allan, to Somerville Industries Limited. Sealing compound applicator. 3,664,296, Cl. 118-246.000

Standard Engineering Co., Inc.: *See—*
Rogers, John A.; and Bossard, Fredrick R., 3,664,451.

Standard Forge and Axle Company, Incorporated: *See—*
Morris, Thomas B.; Paul, Fred; and Powell, Barney R., 3,665,146.

Standard Oil Company: *See—*
Petersen, Richard D.; and Kozinski, Allen A., 3,664,949.

Standun, Inc.: *See—*
Paramonoff, Elpidifor, 3,664,171.

Stanford Research Institute: *See—*
Macovski, Albert, 3,665,097.
Spindt, Charles A.; and Heynick, Louis N., 3,665,241.

Stanger, Leo: *See—*
Leban, Carl, 3,665,450.

Stanley, Charles C., to TRW Inc. Production of a line pattern on a glass plate. 3,664,837, Cl. 96-38.3

Stanley, Paul E.: *See—*
Rogers, Charles J., Sr.; and Stanley, Paul E.,3,665,252.

Stannow, Jorgen Christian, to Danfoss A/S. Thermostatically controlled expansion valve for refrigerating equipment. 3,664,581, Cl. 236-80.

Stanton, Stephen; and Varholy, Edward, to Flynn & Emrich Company. Electronically controlled stitching machine. 3,664,564, Cl. 227-100.000

Stanzel, Victor. Jet propelled model vehicle. 3,664,056, Cl. 46-74.00a

Stark, Marvin; and Knippel, Willis H., to Pullman Incorporated. Covered hopper car with hatch cover means. 3,664,270, Cl. 105-377.

Stauffer-Wacker Silicone Corporation: *See—*
Chadha, Rajendra Nath; and Pande, Kailash Chandra, 3,664,997.

Steadman Industries (Nassau) Limited: *See—*
Hand, Albert Michael, 3,664,533.

Stearns, Richard E., to Tonus, Inc. Music synthesizer keyboard. 3,665,089, Cl. 84-1.100

Steen, Gerhard. Method and apparatus for incinerating solid materials. 3,664,278, Cl. 110-8.00r

Stefani, Richard D., to GTE Sylvania Incorporated. Short circuit protection device for multiple power supplies. 3,665,253, Cl. 317-22.

Steggewentz, Hermann, to Siemens Aktiengesellschaft. Device for epitactic precipitation of semiconductor material. 3,665,139, Cl. 219-10.43

Stehl, Rudolph H., to Dow Chemical Company, The. Pellicular column packing for liquid chromatography. 3,664,967, Cl. 252-431.

Stein, Ernest W.: *See—*
Schiffmann, Robert F.; Stein, Ernest W.; and Kaufman, Harold B., Jr.,3,665,141.

Stein, Stephen, to National Research Development Corporation. Equipment for radiography of pipelines and closed vessels. 3,665,187, Cl. 250-83.3

Steinke, Gary L.: *See—*
Rousseau, Roy S.; Keating, Raymond J.; and Steinke, Gary L.,3,664,085.

Stenz, Herbert: *See—*
Witte, Wolfgang; and Stenz, Herbert,3,664,742.

Stephens, Edward: *See—*
Cross, Dennis Rowland; and Stephens, Edward,3,665,287.

Stephens, James M.; and Tallman, Erven, to Shur-Lift Trailer & Manufacturing Co. Extendable scaffold. 3,664,459, Cl. 182-141.000

Steredyne, Inc.: *See—*
McCorkle, David D., 3,664,903.

Sterigard Corporation: *See—*
Bruce, Roger K., 3,664,557.

Sterns, Lorance E.; and Howard, Arthur G., 1/2 each to M. S. Churchman Inc., and Keyless Lock Company, Inc. Ladder scaffold vehicle. 3,664,458, Cl. 182-102.

Stetsenko, Vladimir Vasilievich: *See—*
Tatianko, Nikolai Vasilievich; Tsymbal, Alexandr Gavrilovich; Stetsenko, Vladimir Vasilievich; Isikov, Sergei Alexandrovich; Rodenko, Fedor Leontievich; Betcher, Alexandr Samuilovich; Shamrai, Petr Dmitrievich; Dulya, Mikhail Afanasievich; Dudka, Viktor Vasilievich; Klimchuk, Ivan Petrovich; and Dolgov, Anatoly Mikhailovich,3,664,431.

Stevens, Henry C.: *See—*
Doran, Thomas J.; Wagner, Melvin P.; and Stevens, Henry C.,3,664,403.

Stewart-Warner Corporation: *See—*
Payne, Robert A.; and Van der Molen, John F., 3,665,280.

Stichweh, James H.; Hornung, Stephen A.; and Duckwall, Paul, III, to Armor Elevator Company, Inc., mesne. Multiple potentiometer timer for elevator controls. 3,665,223, Cl. 307-293.

Stiefvater, Thomas L.; Greiner, James G.; Hale, John K.; and Waldrop, Thomas W., to Sperry Rand Corporation. Rake-tedding device. 3,664,105, Cl. 56-370.

Stifel, George R. P.: *See—*
Evans, Robert G.; and Stifel, George R. P.,3,664,976.

Stigberg, Carl E., to Environment/One Corporation. Check valve. 3,664,775, Cl. 417-566.

Stinson, Joseph B.: *See—*
Drouhard, Alfred J., Jr.; and Stinson, Joseph B.,3,663,970.

Stoddard, Robert D.; Schumacher, Arnold; Conley, Grant W.; and Williams, Roy M., Jr., to Sanders Associates, Inc. Variable rate display generator. 3,665,454, Cl. 340-324.

Stohrer, Charles E., Jr.; and Smith, Bissell J., to Harper-Wyman Company. Burner. 3,664,591, Cl. 239-552.000

Stone Container Corporation: *See—*
Partain, James H.; and Johnson, Richard H., 3,664,573.

Stone, Thomas W., to Singer Company, The, mesne. Method of fastening coil leads. 3,664,017, Cl. 29-596.000

Storage Technology Corporation: *See—*
Aweida, Jesse I.; Arthur, William C.; and Powers, Gale A., 3,664,604.

Stover, Harris A., to Collins Radio Company. Electronic aids for aquanauts. 3,665,380, Cl. 340-6.

Strandberg, Charles F., Jr.; Strandberg, Robert C.; and Kennon, Jerry M., to Strandberg Engineering Laboratories, Inc. Time accumulator for accumulating workers time on the job. 3,665,165, Cl. 235-92.00t

Strandberg Engineering Laboratories, Inc.: *See—*
Strandberg, Charles F., Jr.; Strandberg, Robert C.; and Kennon, Jerry M., 3,665,165.

Strandberg, Robert C.: *See—*
Strandberg, Charles F., Jr.; Strandberg, Robert C.; and Kennon, Jerry M.,3,665,165.

Strang, Urho A.: *See—*
Fournier, Daniel; and Strang, Urho A.,3,664,195.

Strange, Edward A. Offshore power conversion apparatus. 3,664,125, Cl. 60-51.000

Stratford Engineering Corporation: *See—*
McGovern, Louis J.; West, Charles L.; and Webb, Orlando, 3,665,050.

Streater Industries, Inc.: *See—*
Fenwick, Jay G., 3,664,511.
Fenwick, Jay G., 3,664,617.

Strelow, Alfred; and Hascher, Klaus, to Siemens Aktiengesellschaft. Intermediate storer for apparatus for stranding a twisted unit of a cable. 3,664,108, Cl. 57-34.

Stromberg-Carlson Corporation: *See—*
Shaffer, William E., 3,665,109.

Struve, Hans Peter, to Aktiebolaget Siefvert & Fornander. Method in the manufacture of so-called paper wax matches and apparatus for carrying out said method. 3,664,817, Cl. 44-47.000

Stryker Corporation: *See—*
Spence, Wayman R., 3,663,973.

Subjack, William J.: *See—*
Grabner, Roy W.; Zimmerrman, Morris; Subjack, William J.; and Veber, Daniel F.,3,664,926.

Suchomel, Michael; Tipton, William; and Burnett, James H., to General Signal Corporation. Method and apparatus for detecting aerosols. 3,665,441, Cl. 340-237.

Sugahara, Eisuke, to Nippon Piston Ring Kabushiki Kaisha. Torque transmission arrangement. 3,664,153, Cl. 64-31.000

Sugimoto, Kinji: *See—*
Sakabe, Akira; and Sugimoto, Kinji,3,665,149.

Sugio, Akitoshi: *See—*
Yoshikawa, Yoshio; Kondo, Hiroshi; Sugio, Akitoshi; and Kato, Tomotake,3,664,035.

Suh, John T.; and Schnettler, Richard A., to Colgate-Palmolive Company. 2-Hydroxybenzo [b]quinolizines. 3,665,006, Cl. 260-289.

Sullivan, Dean R., to United States of America, Navy. Automatic threshold detector with selectable percentage of threshold crossings. 3,665,326, Cl. 328-151.

Sumitomo Chemical Co., Ltd.: *See—*
Wakazono, Yoshikazu; Ogawa, Terushige; and Otsuka, Yoshiyasu, 3,664,897.

Sumitomo Electric Industries, Ltd.: *See—*
Oga, Toshisaburo; and Okazaki, Ken, 3,664,888.

Sun Oil Company: *See—*
Chaney, Preston E., 3,664,286.
Davis, Ronald I.; and Scott, Kenneth A., 3,665,043.
Davis, Ronald I.; and Scott, Kenneth A., 3,665,045.
Duling, Irl N.; and Merges, John C., Jr., 3,665,068.
Scott, Kenneth A., 3,665,044.

Sunderman, Elwin; and Hilliard, Merle, to Sonnet Tool and Manufacturing Co. Tool holder. 3,664,677, Cl. 279-83.000

Sundstrand Data Control, Inc.: *See—*
Paros, Jerome M., 3,664,237.

Super-Cut, Inc.: *See—*
Metzger, Leopold H.; and Miller, Harold C., 3,664,068.

Superior Continental Corporation: *See—*
Wolf, John E., 3,665,511.

Superior Electric Company, The: *See—*
Loyzim, Robert J., 3,665,284.

Sussingham, George J.; and Fagan, Franklin G., Jr., to Mallory, P. R., & Co., Inc. Reserve type flashlight. 3,665,178, Cl. 240-10.600

Suzuki, Akira; and Ida, Sagamihara Keisuke, to Tokyo Shibaura Electric Co., Ltd. Hermetically sealed electric compressor. 3,664,771, Cl. 417-410.000

Suzuki, Masaru, to Kabushiki-Kaisha Tokai Rika Denki Seisakusho. Hazard warning switch for automotive vehicles. 3,665,130, Cl. 200-61.270

Suzuki, Takashi: *See—*
Takeda, Ikuo; and Suzuki, Takashi,3,665,325.

Svarovsky, James E.: *See—*
Danko, Donald M.; and Svarovsky, James E.,3,664,179.

Svenska Rotor Maskiner Aktiebolag: *See—*
Nilsson, Hans Robert, 3,664,778.

Svenson, James: *See—*
Deradorian, Bagdasar; Svenson, James; and Nalpka, Raymond,3,665,497.

Svenson, Sigvard. Base structure for furniture. 3,664,623, Cl. 248-188.7

Sweeney, Frank B., to Emcon Technology, Inc. PCV valve. 3,664,368, Cl. 137-480.

Sweetheart Plastics, Inc.: *See—*
MacDaniel, Gene D., 3,664,568.

Swered, Paul: *See—*
Shema, Bernard F.; Brink, Robert H., Jr.; and Swered, Paul,3,664,821.

Swett, Leo Ralph; and Ratajczyk, James Daniel, to Abbott Laboratories. 5-Pyrazolylthiopropionic acid derivatives. 3,665,008, Cl. 260-310.

Swiss Aluminium, Ltd.: *See—*
Schaper, Hans; Springer, Kurt; and Kyburz, Edgar, 3,664,946.

Sybron Corporation: *See—*
Goode, John P.; Saeli, John J.; and Sformo, James P., 3,665,372.

Sykes, Christopher; and Denroche, Charles H. P., to Nexus Limited. Adjustable supports. 3,664,627, Cl. 248-246.

Syltebo, Bjarne E.: *See—*
Skidmore, Wallace E.; Syltebo, Bjarne E.; and Viall, Wilton S.,3,664,612.

Sylvania Electric Products Inc.: *See—*
Chiola, Vincent; and Dodds, Phyllis R., 3,664,954.
Tweed, Horace A., Jr., 3,665,310.

Symons Mfg. Company: *See—*
Maynen, James D.; and Bowden, George F., 3,664,630.

Synergetics Research, Inc.: *See—*
Harris, Robert B.; and MacDonald, John A., 3,665,338.

Systems Technology, Inc.: *See—*
Jex, Henry R., 3,664,731.

Tajima, Mataichi, to Fuji Photo Film Co., Ltd. Half tone radiography method and apparatus. 3,665,186, Cl. 250-62.

Takabayashi, Yoshikazu, to Nippon Gakki Seizo Kabushiki Kaisha. Diaphragm for sound instrument and method for producing same. 3,664,911, Cl. 161-160.000

Takahashi, Yasunobu: *See—*
Seko, Maomi; Yomiyama, Agira; Takahashi, Yasunobu; Seta, Shigetoshi; and Nakagawa, Koji,3,664,936.

Takasu, Itaru; Higuchi, Masaru; and Hotta, Hiroshi, to Daicel Ltd. Process for preparing 3-hydroxy-2-methyl-4-pyrone. 3,665,015, Cl. 260-345.9

Takeda, Hajime: *See—*
Ishimatsu, Tsuyoshi; Ito, Takashi; Yano, Masamitsu; Takeda, Hajime; and Nagano, Kentaro,3,664,765.

Takeda, Ikuo; and Suzuki, Takashi, to Takeda Riken Industry Company Limited. Voltage comparator. 3,665,325, Cl. 328-146.

Takeda Riken Industry Company Limited: *See—*
Takeda, Ikuo; and Suzuki, Takashi, 3,665,325.

Takei, Yutaka: *See—*
Iwama, Masabuni; Inoue, Isaburo; Takei, Yutaka; and Endo, Takaya,3,664,841.

Takeuchi, Kenji: *See—*
Murakami, Junzo; Asakawa, Shigeo; and Takeuchi, Kenji,3,665,460.

Takeuchi, Kiyokazu: *See—*
Kaneda, Isao; and Takeuchi, Kiyokazu,3,665,243.

Takiguchi, Hirofumi. Apparatus for automatically and successively opening the bags of powder. 3,664,530, Cl. 214-302.000

Takizawa, Haruki: *See—*
Knodo, Takao; and Takizawa, Haruki,3,665,070.

Talibdzhanov, Zakhidzhan Sadykdzhanovich: *See—*
Akhmedov, Rustam Berovich; Talibdzhanov, Zakhidzhan Sadykdzhanovich; Valikhodzhaev, Asomkhodzha; and Rashidov, Faizulla Karimovich,3,664,587.

Talley, Billy D. Fish-handling device. 3,664,703, Cl. 294-118.000

Talley, James C.: *See—*
Rose, Millard F.; and Talley, James C.,3,664,262.

Tallman, Erven: *See—*
Stephens, James M.; and Tallman, Erven,3,664,459.

Tamura, Takeshi: *See—*
Komatsu, Youji; Tamura, Takeshi; Fujii, Kinya; and Hatsutori, Masafumi,3,665,034.

Tanaka, Atsushi; Kobayashi, Hiroomi; Kudo, Teizo; and Mikumo, Masatoshi, to Daicel Ltd. Method of preparing high impact resistance resins by a bulk-suspension two stage process. 3,665,057, Cl. 260-876.

Tanaka, Susumu, to Minolta Camera Kabushiki Kaisha. Method of transferring an electrostatic image to a dielectric sheet. 3,664,833, Cl. 96-1.000

Tanomura, Masahisa; and Itoi, Kazuo, to Kuraray Co., Ltd. Polyurethane elastomer and method for preparation of same. 3,664,979, Cl. 260-75.

Tao, Eddie V. P., to Lilly, Eli, and Company. Process for 4-alkyl-2,6-dinitrochlorobenzenes. 3,665,042, Cl. 260-646.000

Tapply, William G.: *See—*
Michnik, Lewis; and Tapply, William G.,3,665,321.

Tatianko, Nikolai Vasilievich; Tsymbal, Alexandr Gavrilovich; Stetsenko, Vladimir Vasilievich; Isikov, Sergei Alexandrovich; Rodenko, Fedor Leontievich; Betcher, Alexandr Samuilovich; Shamrai, Petr Dmitrievich; Dulya, Mikhail Afanasievich; Dudka, Viktor Vasilievich; Klimchuk, Ivan Petrovich; and Dolgov, Anatoly Mikhailovich. Agricultural self-propelled harvesting machine. 3,664,431, Cl. 171-58.

Taylor, Allen R., to Singer Company, The, mesne. Antenna. 3,665,476, Cl. 343-701.000

Taylor, Francis R.; Leader, Patricia J.; and Westerdahl, Raymond P., to United States of America, Army. Pyrotechnic composition. 3,664,898, Cl. 149-41.

Taylor, Hugh Gordon: *See—*
Marshall, Alec Frank; and Taylor, Hugh Gordon,3,664,785.

TCI, Inc.: *See—*
Anderson, Robert Du Wayne, 3,664,686.

Teac Corporation: *See—*
Fujikawa, Sukeyoshi; and Uemura, Yasuhiro, 3,664,672.

Technical Operations, Incorporated: *See—*
Mueller, Peter F., 3,664,248.

Tedeco Textile Development Co. A/S: *See—*
Skaathun, Olav; and Troope, Walter S., 3,664,158.

Teeg Research, Inc.: *See—*
McMenamin, James M., 3,665,440.

Teijin Limited: *See—*
Knodo, Takao; and Takizawa, Haruki, 3,665,070.

Tektronix, Inc.: *See—*
Morinaud, Pierre C., 3,665,239.

Teledyne Mid-America Corporation: *See—*
Paris, Ray J.; and Rudd, Harry M., 3,665,376.

Telefonaktiebolaget L M Ericsson: *See—*
Vollmer, Herman Josef Burghardt, 3,665,489.

Telefonaktiebolaget LM Ericson: *See—*
Widl, Walter Herbert Erwin, 3,665,328.

Teletype Corporation: *See—*
Seidlitz, Raymond R., 3,664,471.

Tellerman, Edward M., to Continental Instruments Corporation. Surveillance camera with circuit for automatic activation. 3,664,247, Cl. 95-11.004

Tell, Mayo B.; Kidd, Donald D.; Wickham, William T.; and Brown, Frank. Loom picker. 3,664,382, Cl. 139-159.000

Ter Brugge, Hendrik, to N.V. Hollandse Signaalapparaten. Stable base mounts. 3,664,200, Cl. 74-5.22

Terry, William M.: *See—*
Graham, John W.; Kiel, Othar M.; Terry, William M.; and Sinclair, Albert R.,3,664,420.

Teske, Daniel E., to Emerson Electric Co. Electrical control system. 3,665,219, Cl. 307-252.00b

Teutsch, George J.; and Shapiro, Elliot L., to Schering Corporation. Process for preparation of 6-azido-4,6-bis-dehydro- steroids. 3,665,017, Cl. 260-349.

Texaco Inc.: *See—*
Flournoy, Norman E.; Morrison, John A.; Dancy, Julian H.; and Trippet, Raymond, 3,664,804.

Texas Instruments, Incorporated: *See—*
Graffeo, Joseph Victor, Jr.; Mason, Bertran W., Jr.; and Wells, Wallace Ogden, 3,664,948.

Thaemar, Marvin O.: *See—*
Rice, Herbert L.; Cizek, Arthur; and Thaemar, Marvin O.,3,665,035.

Thamhain, Hans Jurgen: *See—*
Emerson, Paul Gene; Thamhain, Hans Jurgen; and McIntosh, Bruce Cromwell,3,664,116.

Tharmaratnam, Poothathamby, to U.S. Philips Corporation. Transistor amplifier insensitive to the polarity of the supply voltage. 3,665,330, Cl. 330-24.

Thaxton, Ellis B., to Ride-Rite Corporation, mesne. Air spring mounting for pick-up trucks. 3,664,681, Cl. 280-124.00f

Thayer, Olin E., to Amscat Corporation. High density communications system. 3,665,474, Cl. 343-200.
Theobald, Paul R.: *See—*
Davis, M. Paul; and Theobald, Paul R.,3,664,868.
Thermotron Corporation: *See—*
Conrad, Charles F.; and Dadd, Kieth L., 3,664,181.
Thomas, Edward J.; and Friedrich, Ralph E., to Dow Chemical Company, The. Electrical coalescence of polymer fines. 3,664,938, Cl. 204-180.
Thomas, Werner E., to Massey-Ferguson Industries Limited. Drawer locking system. 3,664,720, Cl. 312-219.
Thompson, James Elbert, to Motorola, Inc. Voltage controlled multivibrator. 3,665,343, Cl. 331-113.00r
Thompson, Norman John: *See—*
Broderick, Rory Wilson, 3,664,548.
Thompson, Richard D., to McGraw-Edison Company. Multiple station laundry feeder and control therefor. 3,664,046, Cl. 38-143.000
Thoms, William C., to Berg Electronics, Inc. Bobbin lugger. 3,664,004, Cl. 29-203.00d
Thoms, William C.; and Mancini, Lloyd, to Berg Electronics, Inc. Connector block and method of making the same. 3,665,375, Cl. 339-192.
Thor, Charles C. Removable silage chopper. 3,664,098, Cl. 56-13.9
Thornley, Richard F. M., to International Business Machines Corporation. Recorded signal enhancing apparatus and method. 3,665,429, Cl. 340-174.10h
Tiara Corporation: *See—*
Mechanic, Bernard I., 3,664,230.
Tii Dee Products Co.: *See—*
Hollander, Irvin, 3,664,790.
Tipton, William: *See—*
Suchomel, Michael; Tipton, William; and Burnett, James H.,3,665,441.
Titus, Paul E.: *See—*
Ayers, Ray R.; Titus, Paul E.; and Hanson, James R.,3,664,504.
Tokuyama Soda Kabushiki Kaisha: *See—*
Mizutani, Yukio; and Matsuoka, Seishiro, 3,665,053.
Tokyo Shibaura Electric Co., Ltd.: *See—*
Murakami, Junzo; Asakawa, Shigeo; and Takeuchi, Kenji, 3,665,460.
Negishi, Satoshi, 3,665,407.
Suzuki, Akira; and Ida, Sagamihara Keisuke, 3,664,771.
Tokyo Shibaura Electric Company, Ltd.: *See—*
Tsubouchi, Denji; and Wada, Kenji, 3,665,357.
Tolliver, Peter M., 1/3 to Genca, Samuel R. Gun holster. 3,664,558, Cl. 224-1.00r
Tomiyasu, Kiyo, to General Electric Company. Coolable slab laser. 3,665,335, Cl. 331-94.5
Tompkins, Charles A., 50% to Tompkins, Ketsy Eileen. Tool-level indicator structure. 3,664,032, Cl. 33-207.00r
Tompkins, Ketsy Eileen: *See—*
Tompkins, Charles A., 3,664,032.
Tonkin, Stephen W., to Dunlop Holdings Limited. Pedestrian transport conveyor installations. 3,664,266, Cl. 104-25.000
Tonus, Inc.: *See—*
Stearns, Richard E., 3,665,089.
Tooming, Khugo Gustavovich: *See—*
Pajulaid, Manivald Maximovich; and Tooming, Khugo Gustavovich,3,664,694.
Topazio, Vincent: *See—*
Puchkoff, Zalman P.; and Topazio, Vincent,3,664,572.
Toray Industries, Inc.: *See—*
Ikai, Masaru; Ishii, Toshikazu; and Higashikuze, Michiaki, 3,664,069.
Toth, Louis S.; and Collins, Stuart A., Jr., to Ohio State University, The. Means for holographically recording a three dimensional microscopic sample. 3,664,723, Cl. 350-3.5
Townsend, Vernon R.; and Womeldorf, Waldo M., to Singer Company, The, mesne. X-Y coordinate locator. 3,665,102, Cl. 178-18.
Toyo Spinning Co., Ltd.: *See—*
Watanabe, Kumao; Matumoto, Tooru; and Nakagawa, Tamio, 3,663,974.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Oka, Hiroyuki, 3,664,468.
Transcience Inc.: *See—*
Gram, Herbert R., 3,665,475.
Transvac Electronics Corporation: *See—*
Mauro, Guy, 3,664,476.
Trefzger, Edwin W.; and Crimmins, Bruce, to Singer Company, The. Dual take-up reel. 3,664,607, Cl. 242-195.000
Treible, Edwin S., Jr., to Ingersoll-Rand Company. Work measurement system. 3,664,183, Cl. 73-133.000
Tremblay, Gerard A. Dicing machine. 3,664,396, Cl. 146-78.00a
Trent, Robert L., to United States of America, National Aeronautics and Space Administration. Location identification system. 3,665,313, Cl. 325-55.000
Tri-Tech, Inc.: *See—*
Haydon, Arthur W.; and Crossley, Harry E., 3,665,348.
Triax Company, The: *See—*
Atwater, Wayne G., 3,664,513.
Trieschmann, Hans-Georg; Pfannmueller, Helmut; Gropper, Hans; Gierth, Volker; and Beck, Gilbert, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Polymerization of ethylene with 3-methyl-3- buten-1-ol. 3,664,988, Cl. 260-80.75
Trippet, Raymond: *See—*
Flournoy, Norman E.; Morrison, John A.; Dancy, Julian H.; and Trippet, Raymond,3,664,804.
Troiano, Emilio A. Trotline guide. 3,664,637, Cl. 254-190.
Trok, Benjamin, to International Standard Electric Corporation. Electronic converter. 3,665,290, Cl. 321-47.000
Troope, Walter S.: *See—*
Skaathun, Olav; and Troope, Walter S.,3,664,158.
Trott, Winfield James. Pulse-sound transmitting tube for calibrating underwater sound t. ansducers. 3,665,379, Cl. 340-5.00c
Trovati, Louis, to Dodelino S.A. Method for the manufacture of inflated articles. 3,664,401, Cl. 156-145.000
TRW Inc.: *See—*
Burk, Maksymilian, 3,664,809.
Clark, Clyde C., 3,665,083.
Grill, Raymond J., 3,664,509.
Kirkpatrick, Milton E.; and Mendelson, Ralph A., 3,665,260.
Stanley, Charles C., 3,664,837.
Tsubouchi, Denji; and Wada, Kenji, to Tokyo Shibaura Electric Company, Ltd. Current transformer assembly. 3,665,357, Cl. 336-73.
Tsujide, Tohru: *See—*
Nakanuma, Sho; Tsujide, Tohru; Wada, Toshio; Igarashi, Ryo; and Onoda, Katsuhiro,3,665,423.
Tsymbal, Alexandr Gavrilovich: *See—*
Tatianko, Nikolai Vasilievich; Tsymbal, Alexandr Gavrilovich; Stetsenko, Vladimir Vasilievich; Isikov, Sergei Alexandrovich; Rodenko, Fedor Leontievich; Betcher, Alexandr Samuilovich; Shamrai, Petr Dmitrievich; Dulya, Mikhail Afanasievich; Dudka, Viktor Vasilievich; Klimchuk, Ivan Petrovich; and Dolgov, Anatoly Mikhailovich,3,664,431.
Tucker, Council A., to Scott, E. Walter. Building panel construction and securement means therefor. 3,664,073, Cl. 52-127.
Tulley, Alan: *See—*
Elks, Joseph; Phillipps, Gordon Hanley; and Tulley, Alan,3,665,021.
Tupper, Willis E.; and Hanson, John R., to Dexter Automatic Products Co., Inc. Primer pump. 3,664,774, Cl. 417-560.000
T. V. Manufacturing Limited: *See—*
Ayers, Peter John Henry, 3,665,270.
Twardzik, Georg, to Continental Gummi-Werke Aktiengesellschaft. Pneumatic vehicle tire. 3,664,404, Cl. 152-361.
Tweed, Horace A., Jr., to Sylvania Electric Products Inc. Adapter for converting an AM radio receiver into a citizens band channel 9 transceiver. 3,665,310, Cl. 325-21.000
UCB, Societe Anonyme: *See—*
Pottiez, Fernand; and Verbeest, Raphael, 3,664,930.
Udden, Per Edward Carl; Engman, Bert Hjalmar; and Graf, Siegfried. Electrically powered four-wheeled single vehicle. 3,664,450, Cl. 180-65.00r
Udylite Corporation: *See—*
Buckley, Edward Z., 3,664,944.
Clauss, Richard J., 3,664,933.
Udylite Corporation, The: *See—*
Minbiole, Louis J., Jr.; Clark, Chester G.; and Neumann, John W., 3,664,354.
Uemura, Yasuhiro: *See—*
Fujikawa, Sukeyoshi; and Uemura, Yasuhiro,3,664,672.
Uffner, Melville W.: *See—*
Moyer, Ronald C.; and Uffner, Melville W.,3,664,987.
Uhtenwoldt, Herbert R., to Heald Machine Company, The. Toolhead. 3,664,718, Cl. 308-189.1
Ujiie, Akira, to Mitsubishi Jukogyo Kabushiki Kaisha. Method of constructing substantially circular cross-section vessel by welding. 3,665,143, Cl. 219-76.
Ullmann, Gunther: *See—*
Vogel, Erich; and Ullmann, Gunther,3,664,201.
Ulmer, Gene C.: *See—*
Leonard, Regis J.; and Ulmer, Gene C.,3,664,853.
Underwood, Lee D., to Concept Research Corporation. Method of coloring metals by the application of heat. 3,664,884, Cl. 148-6.3
Underwood, William G. E.: *See—*
Kennedy, James; Long, Alan Gibson; and Underwood, William G. E.,3,665,003.
Union Carbide Corporation: *See—*
Amthor, Helmut K., 3,664,878.
Assarsson, Per Gunnar, 3,664,343.
Koechner, Walter, 3,665,337.
Union Oil Company of California: *See—*
Holm, Leroy W., 3,664,419.
Yates, Kenneth P., 3,665,297.
Uniroyal, Inc.: *See—*
Snodgrass, Hugh E.; and Lauchlan, Robert L., 3,665,058.
Uniroyal, Ltd.: *See—*
Cohen, Margalit; and Mac Phee, Kenneth E., 3,664,974.
Evans, Robert G.; and Stifel, George R. P., 3,664,976.
United Aircraft Corporation: *See—*
Adams, Don L.; and Allen, Nicholas, 3,665,217.
Buswell, Richard F.; Nicholas, Peter G.; and Olsson, William J., 3,664,873.
McLafferty, George H., 3,665,336.
Vessel, Eugene D., 3,664,131.
Vessel, Eugene D.; and Ebeling, Robert W., Jr., 3,664,132.

United Kingdom Atomic Energy Authority: *See—*
Royle, Joseph Kenneth; Grant, John; and Golder, Jack Alexander, 3,664,360.
United States Banknote Corporation: *See—*
Eberly, David H., Jr., 3,665,061.
United States of America
Agriculture: *See—*
McDonald, Kent A.; and Cox, Roger G., 3,664,180.
Air Force: *See—*
Madle, Peter J., 3,665,096.
Mitchell, James H.; and Mueggenburg, Hans H., 3,664,588.
Army: *See—*
Hubbuch, Theodore; Murfree, James A., Jr.; Duncan, William A.; Sandlin, Billy J.; and Nappier, Henry A., 3,664,969.
Kubanoff, Jacob H., 3,665,463.
Messina, Joseph F.; and Gisser, Henry, 3,664,956.
Messina, Joseph F.; and Gisser, Henry, 3,664,958.
Scruggs, James A., 3,664,811.
Taylor, Francis R.; Leader, Patricia J.; and Westerdahl, Raymond P., 3,664,898.
Atomic Energy Commission: *See—*
Beatty, Ronald L.; and Kiplinger, Dale V., 3,664,859.
Christofilos, Nicholas C., 3,664,921.
Gaines, Jerry L.; Ebert, Paul J.; Mancebo, Lloyd; and Cook, Frederick D., 3,665,236.
Liu, Shing-Gong, 3,665,339.
Saraceno, Anthony J.; Walters, Reed H.; Jones, Donald B.; and Wiehle, William E., 3,664,950.
Interior: *See—*
Greyson, Jerome; and Rogers, Howard H., 3,664,940.
National Aeronautics and Space Administration, Administrator, with respect to an invention of:
Hilbert, Edward E. Flexible computer accessed telemetry. 3,665,417, Cl. 340-172.500
Kallins, Charles, and Ostroff, Jerome. Rotary actuator. 3,664,185, Cl. 73-136.00r
Woo, Kenneth E. Multi-purpose antenna employing dish reflector with plural coaxial horn weeds. 3,665,481, Cl. 343-762.000
National Aeronautics and Space Administration: *See—*
Cocca, Frank J., 3,665,307.
Epstein, Joseph, 3,664,874.
Haroules, George G.; Brown, Wilfred E., III; Ewen, Harold I.; Lilley, Arthur E.; and Kodis, Ralph D., 3,665,467.
Trent, Robert L., 3,665,313.
Navy: *See—*
Bauer, Benjamin B., 3,665,381.
Britt, A. D.; and Moniz, William B., 3,664,985.
Elkins, James H., 3,665,509.
Ellard, James S., Jr., 3,663,989.
Iwanciow, Bernard L.; and Chase, Robert A., 3,664,133.
Mangleburg, Charles S., 3,664,176.
Piper, Thomas E., 3,665,151.
Rose, Millard F.; and Talley, James C., 3,664,262.
Sullivan, Dean R., 3,665,326.
Williams, Melvin F., 3,665,469.
Winget, Clifford L.; Gibson, George W.; and Shultz, William S., 3,664,438.
United States of American, Navy: *See—*
Schneider, William E., 3,664,371.
United Systems Corporation: *See—*
Petrohilos, Harry G., 3,665,305.
Unitek Corporation: *See—*
Laub, Joseph L., 3,664,567.
Universal Oil Products Company: *See—*
DeRosset, Armand J., 3,665,046.
University of California, Regents of the: *See—*
Luner, Stephen J.; and Kolin, Alexander, 3,664,939.
University of Utah: *See—*
Erdahl, Alan C.; and Evans, David C., 3,665,408.
Upjohn Company, The: *See—*
Bannister, Brian, 3,664,998.
Perper, Robert J., 3,664,994.
Uraneck, Carl A.; and Burleigh, John E., to Phillips Petroleum Company. Agglomeration of fine rubber particles. 3,664,978, Cl. 260-5.
Urbahn, Fritz: *See—*
Weber, Klaus; and Urbahn, Fritz,3,664,111.
Urbanosky, Harold J., to Schlumberger Technology Corporation. Methods for inhibiting the production of loose formation materials. 3,664,421, Cl. 166-278.
U.S. Philips Corporation: *See—*
Dubravec, Vladimir, 3,665,242.
Leuthold, Peter, 3,665,314.
Roza, Engel; Benning, Herman J.G.M.; and Lommers, Anthonius J.J.C.L., 3,665,344.
Schagen, Pieter, 3,665,184.
Tharmaratnam, Poothathamby, 3,665,330.
Van Esdonk, Johannes; and Janssen, Joannes Franciscus Maria, 3,665,238.
Wiarda, Robartus Pieter; and Van Dorn, Willem, 3,665,331.
Utah State University: *See—*
Campbell, Curtis B.; and Grover, Ben L., 3,664,192.
Vacaro, Angelo L. Garbage bag retention means. 3,664,622, Cl. 248-95.
Valbjorn, Knud Vagan: *See—*
Leffers, Hans Ulrik; Romer, Bendt Wegge; and Valbjorn, Knud Vagan,3,664,461.
Valbjorn, Knud Vagn: *See—*
Knudsen, Jorgen Dahlman; Romer, Bendt Wegge; and Valbjorn, Knud Vagn,3,664,769.
Valbonesi, Giuseppe, to Societa Italiana Telecomunicazioni Siemens S.p.A. Repeater with bias-compensating means. 3,665,125, Cl. 179-170.
Valentine, Harry M., to Bendix-Westinghouse Automotive Air Brake Company. Locking means for a valve operating plunger. 3,664,632, Cl. 251-101.
Valikhodzhaev, Asomkhodzha: *See—*
Akhmedov, Rustam Berovich; Talibdzhanov, Zakhidzhan Sadykdzhanovich; Valikhodzhaev, Asomkhodzha; and Rashidov, Faizulla Karimovich,3,664,587.
Valint, Paul L., Jr., to Esso Research and Engineering Company. Azinyl organophosphorus compounds. 3,665,001, Cl. 260-239.
Valle, Thomas, 1/3 to Crandell, Ralph R., and 1/3 to Hack, Albert G. W. Tool for attaching sinkers to a fishing line. 3,664,006, Cl. 29-212.
Valley Decorating Company: *See—*
Sneller, Lee J., 3,664,626.
Van Arsdale, Lyle R.: *See—*
Grove, Marvin H.; and Van Arsdale, Lyle R.,3,664,356.
van den Heuvel, Anthony P.; Owen, Ronald B.; and Joshi, Shrinivas G., to IIT Research Institute. Hybrid surface-wave transducer. 3,665,225, Cl. 310-8.1
Van Der Meide, Benjamin. Material handling apparatus. 3,664,678, Cl. 280-47.2
Van der Molen, John F.: *See—*
Payne, Robert A.; and Van der Molen, John F.,3,665,280.
Van Dorn, Willem: *See—*
Wiarda, Robartus Pieter; and Van Dorn, Willem,3,665,331.
Van Esdonk, Johannes; and Janssen, Joannes Franciscus Maria, to U.S. Philips Corporation. Electric gas discharge tube having vacuum tight sealing means for a plurality of supply leads positioned close together. 3,665,238, Cl. 313-220.000
Van Horn, Gary R.: *See—*
Kartchner, Earl M.; Van Horn, Gary R.; and Wallace, Richard A.,3,665,472.
Van Uitert, Le Grand Gerard: *See—*
Bobeck, Andrew Henry; Sherwood, Richard Curry; and Van Uitert, Le Grand Gerard,3,665,427.
Vapor Corporation: *See—*
Bridgeman, Richard C.; and Gajewski, Wieslaw, 3,664,177.
Vardell, Joseph R. Track laying accessory for a tractor. 3,664,449, Cl. 180-9.40c
Varholy, Edward: *See—*
Stanton, Stephen; and Varholy, Edward,3,664,564.
Varian Associates: *See—*
White, Jerome R., 3,665,140.
Varrichio, Ralph A.: *See—*
Shaler, David; and Varrichio, Ralph A.,3,664,299.
VDO Tachometer Werke: *See—*
Brummer, Hans; and Busch, Karl, 3,665,439.
VDO Tachometer Werke Adolf Schindling GmbH: *See—*
Metzger, Reinhold, 3,664,202.
Veber, Daniel F.: *See—*
Grabner, Roy W.; Zimmerrman, Morris; Subjack, William J.; and Veber, Daniel F.,3,664,926.
Vecchi, John C., to Oberg Manufacturing Co., Inc. Die support with guide posts. 3,664,258, Cl. 100-214.000
Vecchio, Luigi. Therapeutic vibrating pads. 3,664,332, Cl. 128-24.2
Velazquez, Edward, to AAI Corporation. Motor and hoist control arrangement. 3,665,277, Cl. 318-447.
Verbeest, Raphael: *See—*
Pottiez, Fernand; and Verbeest, Raphael,3,664,930.
Verdier, Henri, to Compagnie Generale des Etablissements Michelin raison sociale Michelin & Cie. Wheel assembly. 3,664,708, Cl. 301-9.
Vereinigte Flugtechnische Werke Fokker GmbH: *See—*
Euer, Hartmut; and Pauli, Gunter, 3,665,505.
Vermillion, Clarence W. Joint movement limiting arrangement for prosthetic legs. 3,663,967, Cl. 3-15.
Vernaleken, Hugo: *See—*
Fuhr, Karl; Vernaleken, Hugo; Heine, Hans-Georg; Rudolph, Hans; and Schnell, Hermann,3,664,937.
Vertnik, Leonard R., to General Mills, Inc. Polyamides of polymeric fat acids and 1-amino- 3-aminomethyl-3,5,5-trimethyl cyclohexane. 3,664,980, Cl. 260-18.
Vertut, Jean: *See—*
Germond, Jean-Claude; Guilbaud, Jean-Pierre; and Vertut, Jean,3,664,517.
Vessel, Eugene D., to United Aircraft Corporation. Hybrid rocket fuel and process of propulsion using tetraformaltriazine. 3,664,131, Cl. 60-220.000
Vessel, Eugene D.; and Ebeling, Robert W., Jr., to United Aircraft Corporation. Hypergolic propellant systems using tetraformal- triazine. 3,664,132, Cl. 60-220.000
Vetco Offshore Industries, Inc.: *See—*
Hanes, James W. E., 3,664,689.
Viall, Wilton S.: *See—*
Skidmore, Wallace E.; Syltebo, Bjarne E.; and Viall, Wilton S.,3,664,612.

Vibrac Corporation: *See—*
Hendershot, James R., Jr.; and Searle, Robert F., 3,664,473.

Vickers Limited: *See—*
Smith, Francis Hughes, 3,664,745.

Victor, Irving, to Research Development Co. Dry cleaning of textile fibers and other garment materials with chlorofluoro hydrocarbons having relatively high freezing points. 3,664,806, Cl. 8-142.

Viessmann, Hans. Boilers. 3,664,308, Cl. 122-149.

Vincent, Andrew W. Electromagnetic shutter with detent. 3,664,251, Cl. 95-59.

Vincent, James Henry, to American Standard Inc. Collecting apparatus for electrostatic precipitators. 3,664,092, Cl. 55-112.

Vogel, Erich; and Ullmann, Gunther, to Bosch, Robert, GmbH. Starter drive for combustion engines. 3,664,201, Cl. 74-6.000

Voglesonger, Harry M., to Dynamics Corporation of America. Push-in connector switch. 3,665,373, Cl. 339-95.

Volinsky, George, Jr.: *See—*
Klingensmith, James D.; and Volinsky, George, Jr.,3,664,080.

Vollmer, Herman Josef Burghardt, to Telefonaktiebolaget L M Ericsson. Telephone instrument for voice frequency choice of number. 3,665,489, Cl. 179-90.

Vollrath Co., The: *See—*
Rickmeier, Carl H., Jr., 3,664,553.

Volpp, Gert P.: *See—*
Hills, William A.; and Volpp, Gert P.,3,665,000.

Von Falkai, Bela: *See—*
Kubitzek, Harry; Essig, Karl-August; Von Falkai, Bela; Reichle, Alfred; and Bodesheim, Ferdinand,3,664,914.

Von Lersner, Wolf A., to Campbell Soup Company. Mixing and dispensing unit. 3,664,555, Cl. 222-145.

Vrijma, Berend, to Calsilox S.A. Apparatus for cutting a block of plastic material. 3,664,219, Cl. 25-112.

Vuillot, Michel: *See—*
Guillot, Pierre; and Vuillot, Michel,3,665,180.

Vyzkumny ustav pletarsky: *See—*
Kochta, Zdenek; and Dvoracnek, Karel, 3,664,157.

Vyzkumny ustav pozemnich staveb: *See—*
Florian, Jaroslav; and Binovec, Ladislav, 3,664,488.

Waagner-Biro AG: *See—*
Wenzel, Hermann, 3,664,386.

Wada, Kenji: *See—*
Tsubouchi, Denji; and Wada, Kenji,3,665,357.

Wada, Toshio: *See—*
Nakanuma, Sho; Tsujide, Tohru; Wada, Toshio; Igarashi, Ryo; and Onoda, Katsuhiro,3,665,423.

Wagar, Albert E., to Cluett, Peabody & Co., Inc. Method and apparatus for assembling shirt parts. 3,664,282, Cl. 112-121.150

Wagner, Melvin P.: *See—*
Doran, Thomas J.; Wagner, Melvin P.; and Stevens, Henry C.,3,664,403.

Wahlgren, Wallace W.: *See—*
Douglas, Ellwood S.; and Wahlgren, Wallace W.,3,665,356.

Wakamatsu, Hisato: *See—*
Kato, Takaaki; Kawakubo, Mamoru; Ito, Katsunori; and Wakamatsu, Hisato,3,665,213.

Wakazono, Yoshikazu; Ogawa, Terushige; and Otsuka, Yoshiyasu, to Sumitomo Chemical Co., Ltd. Slurry explosive comprising ammonium nitrate and aluminum powder. 3,664,897, Cl. 149-38.

Waldrop, Thomas W.: *See—*
Stiefvater, Thomas L.; Greiner, James G.; Hale, John K.; and Waldrop, Thomas W.,3,664,105.

Walker, Brooks. Carburetor. 3,664,313, Cl. 123-119.

Walker, Brooks. Energy absorber. 3,664,653, Cl. 267-139.

Walker, Frank A.: *See—*
Dupree, James N.; and Walker, Frank A.,3,665,459.

Walker, Kenneth Allan: *See—*
Stamp, George Frederick; and Walker, Kenneth Allan,3,664,296.

Walker, Wendell C.; and Davidson, William E., to General Electric Company. Spray iron. 3,664,045, Cl. 38-77.5

Walker, Wendell C.: *See—*
Foster, S. Harold; and Walker, Wendell C.,3,665,152.

Walker-Neer Manufacturing Co., Inc.: *See—*
Campbell, John David, 3,664,443.

Wall, Byron T. Cigarette. 3,664,350, Cl. 131-10.

Wallace, Richard A.: *See—*
Kartchner, Earl M.; Van Horn, Gary R.; and Wallace, Richard A.,3,665,472.

Wallace, Robert S. Tape cassette sleeve. 3,664,492, Cl. 206-1.

Wallace-Murray Corporation: *See—*
Harvill, J D.; and Harlan, Kenneth C., 3,664,165.

Wallenstein, Mihaly, to Ganz Villamossagi Muvek. Device for increasing the intensity of gas cooling of electrical machines with high-speed rotor. 3,665,230, Cl. 310-60.000

Waller, John G.: *See—*
Pearl, David L.; Waller, John G.; and Head, Beverly P., Jr.,3,664,574.

Wallick, Claude Rollin, Jr.; Blodgett, William Edward; and Lazor, Donald Keith, to American Standard Inc. Powder compacting press. 3,664,799, Cl. 25-29.000

Walsh, George M.; and Chramiec, Mark A., to Raytheon Company. Waveform regenerator for use with a digital correlator. 3,665,413, Cl. 340-172.5

Walters, Reed H.: *See—*
Saraceno, Anthony J.; Walters, Reed H.; Jones, Donald B.; and Wiehle, William E.,3,664,950.

Walther, Terry R.: *See—*
McCoy, Michael R.; and Walther, Terry R.,3,665,422.

Walton, Peter, to Serck Industries Limited. Fluid pressure operated servo arrangement. 3,664,235, Cl. 91-387.

Walton, Richard S., to Hamilton Watch Company. Electronically controlled timepiece using low power MOS transistor circuitry. 3,664,118, Cl. 58-50.00r

Wamser, Anton: *See—*
Samietz, Klaus P.; Wamser, Anton; and Weingartner, Ernst F.,3,665,084.

Wanamaker, John L.: *See—*
Weber, Kenneth E.; Hoch, Geraldine H.; and Wanamaker, John L.,3,664,808.

Wangard, William; and Fleeton, David W., to Heller, Walter E., & Company, mesne. Device for automatically producing tone patterns based on a tonic note. 3,665,090, Cl. 84-1.300

Wapner, Stanley H.; and Soriente, Alfonse J., to Ecodyne Corporation. Apparatus for inserting filter elements into a tank. 3,664,003, Cl. 29-200.

Ware, R. Louis. Plant growth apparatus. 3,664,063, Cl. 47-39.

Warner & Swasey Company, The: *See—*
Selby, Jack H., 3,664,215.

Warnow, Detlef, to Dragerwerk Aktiengesellschaft. Trigger device for operating a control valve of a respirator system. 3,664,370, Cl. 137-487.5

Warwick Electronics Inc.: *See—*
Brand, John R.; and Smith, Ernest A., 3,665,088.

Watanabe, Kumao; Matumoto, Tooru; and Nakagawa, Tamio, to Toyo Spinning Co., Ltd. Treatment of a cross-linking agent-impregnated cellulosic fabric with a gaseous acid catalyst. 3,663,974, Cl. 8-116.4

Watkins, Bruce J., to Regan Forge and Engineering Company. Flow line diverter apparatus. 3,664,376, Cl. 137-625.68

Watkins, Robert V., to International Business Machines Corporation. Synchronous frequency shift data transmission system in which opposite binary characterizations are transmitted as half cycles of a first carrier signal of a first carrier signal of frequency equal to that of a keying signal and as full cycles of a second carrier signal of frequency twice that of the keying signal. 3,665,103, Cl. 178-66.00r

Watson, George A., to Celanese Corporation. Method of making a semi-continuous filament combination yarn. 3,664,115, Cl. 57-156.

Watts, Richard James: *See—*
Davies, Stuart Duncan; McCarthy, Roy Fred John; and Watts, Richard James,3,664,764.

Wayson, Andrew J., to Merriman, Inc. Traveler with means for limiting friction and tilting. 3,664,113, Cl. 57-125.

Webb, Jervis B., Company: *See—*
Kondur, Louis, 3,664,701.

Webb, Orlando: *See—*
McGovern, Louis J.; West, Charles L.; and Webb, Orlando,3,665,050.

Webb, Robert M.; and Parry, Keith S., to Creears, T. H., Corporation. Fluid level control system. 3,665,209, Cl. 307-118.000

Weber Dental Manufacturing Company, The: *See—*
Buchtel, Dean H.; and Maurer, John A., 3,664,024.

Weber, Kenneth E.; Hoch, Geraldine H.; and Wanamaker, John L., to Lockheed Aircraft Corporation. Production of dicobaltous oxychromate and percobaltous oxychromate. 3,664,808, Cl. 23-56.000

Weber, Klaus; and Urbahn, Fritz, to Barmag Barmer Maschinenfabrik Aktiengesellschaft. Multi-spindle drive means for spinning and twisting machines. 3,664,111, Cl. 57-105.

Weber, Paul; Ritzmann, Horst; and Butschko, Gerhard, to Polysius AG. Apparatus for heat treatment of material from which water has been mechanically extra cted. 3,664,650, Cl. 263-32.

Webster Electric Company, Inc.: *See—*
Campbell, Richard H., 3,665,332.
McMillin, Grant L., Jr., 3,664,609.

Weeks, Horace W.; and Frazier, John R., to National Cash Register Company, The. Letter feeder, synchronous friction type. 3,664,661, Cl. 271-36.

Weidenmuller, Hilmar: *See—*
Kraemer, Friedrich; Mandel, Jorn; Mayer, Siegfried; Rohrig, Klaus; Schulz, Hans-Peter; Weidenmuller, Hilmar; Haverkamp, Klaus Dieter; and Motz, Jurgen,3,664,826.

Weidlin von Boden, Alberto; and Enzian, Ernest, to Countess Mara, Inc. Fabric-holding clamp for embroidery machines. 3,664,288, Cl. 112-103.

Weigelt, Peter. Magnetic door closure device. 3,664,699, Cl. 292-251.500

Weingartner, Ernst F.: *See—*
Samietz, Klaus P.; Wamser, Anton; and Weingartner, Ernst F.,3,665,084.

Weinheimer Gummiwarenfabrik Weisbrod & Seifert GmbH: *See—*
Haberhauer, Karl; and Haberhauer, Hertha, 3,664,380.

Weinkle, David, to Addmaster Corporation. Drum series printer with stop pawl engaged by a snap-over spring. 3,664,259, Cl. 101-99.000

Weinstein, Albert, to Wellington Products, Inc. Boat speedometers. 3,664,189, Cl. 73-185.

Weisang, Joseph-Edouard: *See—*
Gislon, Andre; Weisang, Joseph-Edouard; and Maurin, Jean,3,665,047.

Weischedel, Herbert Rudolf; and Westerman, George Raymond, to Bell Telephone Laboratories, Incorporated. Self-oscillating constant frequency switching regulator with phase control of voltage regulation loop. 3,665,291, Cl. 323-17.000

Weise, Irvin B., to Anderson, Greenwood & Co. Pilot valve. 3,664,362, Cl. 137-102.000

Weiss, Erwin M., to Beltone Electronics Corporation. Directional responsive hearing aid. 3,665,121, Cl. 179-107.

Weiss, Erwin M., to Beltone Electronics Corporation. Hearing aid construction utilizing a vented transducer compartment for reducing feedback. 3,665,122, Cl. 179-107.

Weiss, Gerhart; and Enamann, Burt W., to Ideal Toy Corporation. Tape talking mechanism. 3,664,673, Cl. 274-11.00r

Wellington Products, Inc.: *See—*
Weinstein, Albert, 3,664,189.

Wells, Joe S., deceased0 (by Wells, Mary Lou; executrix). Tool depth control adjustment. 3,664,756, Cl. 408-202.

Wells, Mary Lou: *See—*
Wells, Joe S.,3,664,756.

Wells, Sylvan O., to Kenwal Machine Company, Inc. Double head notching machine. 3,664,394, Cl. 144-133.

Wells, Wallace Ogden: *See—*
Graffeo, Joseph Victor, Jr.; Mason, Bertran W., Jr.; and Wells, Wallace Ogden,3,664,948.

Wendler, Guenther, to Baumueller, Adam, GmbH Fabrik fur Elektrotechnik. Automatically adjustable single disc brake for motors. 3,665,231, Cl. 310-77.

Wenzel Company, The: *See—*
Atkin, Wesley H., 3,664,090.

Wenzel, Hermann, to Waagner-Biro AG. Apparatus for filling fluids into vehicle containers. 3,664,386, Cl. 141-100.

Werner, Georg: *See—*
Helmers, Helmut; Werner, Georg; and Rix, Albert,3,664,480.

Werner, John R., to Burroughs Corporation. Multi-processor processing system having interprocessor interrupt apparatus. 3,665,404, Cl. 340-172.5

Werner, Wolfgang: *See—*
Jakszt, Werner; Schiele, Gert; and Werner, Wolfgang,3,665,255.

West, Charles L.: *See—*
McGovern, Louis J.; West, Charles L.; and Webb, Orlando,3,665,050.

West, Robert C.: *See—*
Penberthy, Walter L., Jr.; Bayless, Jack H.; and West, Robert C.,3,664,424.

Westerdahl, Raymond P.: *See—*
Taylor, Francis R.; Leader, Patricia J.; and Westerdahl, Raymond P.,3,664,898.

Westerfield, James: *See—*
Glucoft, Harold; and Westerfield, James,3,664,029.

Westerman, George Raymond: *See—*
Weischedel, Herbert Rudolf; and Westerman, George Raymond,3,665,291.

Western Electric Company, Incorporated: *See—*
Frank, Gerard A.; Kipp, Karl F.; and Oswald, Donald R., 3,664,872.

Westinghouse Air Brake Company: *See—*
Buckeridge, Roger M., 3,665,251.

Westinghouse Electric Corporation: *See—*
Fischer, William H., 3,665,134.
Reese, Frank L.; and Dakin, Hayes O., Jr., 3,665,133.

Westmore, Anna Mira: *See—*
Krauss, Walter Francis Henry; and Westmore, Norman Ernest,3,664,489.

Westmore, Norman Ernest: *See—*
Krauss, Walter Francis Henry; and Westmore, Norman Ernest,3,664,489.

Wheable, Desmond, to Solartron Electronic Group Limited, The. Analog to digital converter. 3,665,457, Cl. 340-347.

Wheatley, Carl F., Jr.: *See—*
Goun, Nathan M.; and Wheatley, Carl F., Jr.,3,665,256.

Wheaton, Roger W., to Plessey Handel und Investments A.G. Electrical inverter circuit arrangements. 3,665,503, Cl. 321-45.

Whirlpool Corporation: *See—*
Becker, Stephen A.; and Knoop, Donald E., 3,665,159.

Whitaker, Earl J.: *See—*
Greenspan, Lawrence E.; and Whitaker, Earl J.,3,665,402.

White, Arnold George; Smith, Thomas Edward; Work, Lyall Campbell; and Miller, Willard Wallace, to Cominco Ltd. Electrothermally concentrating an aqueous electrolyte. 3,664,929, Cl. 203-10.

White Farm Equipment Company: *See—*
Cottrell, Samuel H.; and Montgomery, Sam R., 3,664,453.
Cottrell, Samuel H., 3,664,454.

White, Frederick M., to General Electric Company. Dual ratchet clutch drive. 3,664,207, Cl. 74-337.5

White, Jerome R., to Varian Associates. Microwave chamber having energy density control system. 3,665,140, Cl. 219-10.550

White Motor Corporation of Canada Limited: *See—*
Maiste, Arved; and Robertson, Melvin F., 3,664,348.

Whitehurst, George: *See—*
Skinner, Jack; and Whitehurst, George,3,664,317.

Whole Earth Corporation, The: *See—*
Seitz, Joseph R. M., 3,664,134.

Wiarda, Robartus Pieter; and Van Dorn, Willem, to U.S. Philips Corporation, mesne. Device comprising a transistor amplifier having an imput amplifying stage and an output amplifying stage. 3,665,331, Cl. 330-28.000

Wickham, William T.: *See—*
Tell, Mayo B.; Kidd, Donald D.; Wickham, William T.; and Brown, Frank,3,664,382.

Wickliff, Noble Ervin, to Bell Telephone Laboratories, Incorporated. Transistor bridge rectifier circuit. 3,665,221, Cl. 307-255.000

Wicklund, Dale L. Shaker screen apparatus for mortar mixers. 3,664,644, Cl. 259-164.

Widder, Rudi; Distler, Harry; and Haug, Erwin, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Durably shaping keratinous fibrous materials. 3,664,864, Cl. 117-119.8

Widl, Walter Herbert Erwin, to Telefonaktiebolaget LM Ericson. Synchronizing signal generator for use with a differentially multiphase modulated signal receiver. 3,665,328, Cl. 329-110.

Widman, Michael U., to Battelle Development Corporation, The. Silt stabilization device. 3,664,781, Cl. 18-13.

Wiehle, William E.: *See—*
Saraceno, Anthony J.; Walters, Reed H.; Jones, Donald B.; and Wiehle, William E.,3,664,950.

Wienert, Lloyd C., to Wilson & Co., Inc., mesne. Lactation period brooder. 3,664,302, Cl. 119-18.

Wigstol, Eivind, to Falconbridge Nickel Mines Limited. Purification of organic solvents containing metals by peroxide wash. 3,664,815, Cl. 23-312.

Wilcox, Howard A.: *See—*
Di Napoli, Nicholas; Friedman, Donald; Nicholls, Robin P.; Wilcox, Howard A.; and Wood, Charles E.,3,665,397.

Wilke, Heinz; and Bertram, Claus, to Bosch, Robert, G.m.b.H. Method of making a commutator. 3,664,012, Cl. 29-597.000

Wilken, Gerd: *See—*
Hinrichs, Kurt; and Wilken, Gerd,3,665,430.

Williams, George L.: *See—*
Sinker, Robert A.; and Williams, George L.,3,665,226.

Williams, James W., III; and Fetterolf, John S. Slip-type expansion joint and packing joint. 3,664,690, Cl. 285-96.000

Williams, Melvin F., to United States of America, Navy. Apparatus for improving the lane resolution capabilities of omega navigation receivers. 3,665,469, Cl. 343-105.000

Williams, Robert A. Fuse with retractable indicator strip. 3,665,361, Cl. 337-265.

Williams, Roy M., Jr.: *See—*
Stoddard, Robert D.; Schumacher, Arnold; Conley, Grant W.; and Williams, Roy M., Jr.,3,665,454.

Williams, Thomas B.: *See—*
Norman, Vello; and Williams, Thomas B.,3,664,352.

Willson, James R.: *See—*
Jackson, Wilbur F.; and Willson, James R.,3,664,582.

Wilson & Co., Inc.: *See—*
Wienert, Lloyd C., 3,664,302.

Wilson, Alonzo A.: *See—*
Prentky, Peter I.; and Wilson, Alonzo A.,3,665,327.

Wilson, David A.: *See—*
James, Robert C.; Wilson, David A.; and Pringle, Frank E., Jr.,3,664,086.

Wilson, Laurence M.: *See—*
Applequist, Roy A.; and Wilson, Laurence M.,3,665,434.

Wilson, Robert W., to Bouligny, R. H., Inc. Tobacco bulk curing system with improved curing air flow rate control. 3,664,034, Cl. 34-225.

Wilson, Ronald H.: *See—*
Schaefer, Donald L.; and Wilson, Ronald H.,3,664,895.

Wilton Enterprises, Inc.: *See—*
Wilton, Norman M., 3,664,794.

Wilton, Norman M., to Wilton Enterprises, Inc. Multiple line decorating device. 3,664,794, Cl. 425-192.000

Wimer, Charles W.: *See—*
Schrade, Hans Christoph; Del Giudice, William F.; and Wimer, Charles W.,3,664,162.

Wingard Limited: *See—*
Sargeant, Archibald, 3,664,600.

Winget, Clifford L.; Gibson, George W.; and Shultz, William S., to United States of America, Navy. Underwater rock core sampling device and method of use thereof. 3,664,438, Cl. 175-6.000

Winner Boats: *See—*
Momany, Ned K., 3,663,976.

Winston, John M.; and Zimmerman, Walter H., to General Motors Corporation. Brake condition warning switch and system. 3,665,389, Cl. 340-60.

Winter, Joseph, to Olin Corporation. Method of producing a deep drawn composite article. 3,664,890, Cl. 148-11.50a

Witkin, Donald E., to National Forge Company. Variable clearance thread closure. 3,664,540, Cl. 220-39.

Witte, Wolfgang; and Stenz, Herbert, to Bodenseewerk Perkin-Elmer & Co., GmbH. Monochromator slit systems. 3,664,742, Cl. 356-80.

Woelbel, Wilhelm, to Container Corporation of America. Label registration for helically wound container bodies. 3,664,239, Cl. 93-80.

Wojcik, David S.: *See—*
Schmersal, Larry J.; Miavecz, Joseph L.; Pierce, Edward W.; and Wojcik, David S.,3,665,455.

Wolder, Ernest Harold; and Jarrett, James Harold. Plastic molded pallet. 3,664,271, Cl. 108-51.

Wolf, John E., to Superior Continental Corporation. Magnetic detection apparatus. 3,665,511, Cl. 340-258.00d
Wolfe, Gregory John. Vacuum closure for open ended containers. 3,664,542, Cl. 220-44.
Wollard Aircraft Equipment, Inc.: *See—*
Smith, James W., Sr.; Evans, Benjiman E.; Riggles, William M., Jr.; and Schormann, Urmas, 3,664,456.
Womeldorf, Waldo M.: *See—*
Townsend, Vernon R.; and Womeldorf, Waldo M.,3,665,102.
Wong, Herman: *See—*
Becker, Carl H.; Dell, Harold R.; McFarland, Keith E.; and Wong, Herman,3,665,483.
Woo, Kenneth E.: *See—*
United States of America,National Aeronautics and Space Administration, Administrator, 3,665,481.
Wood, Charles E.: *See—*
Di Napoli, Nicholas; Friedman, Donald; Nicholls, Robin P.; Wilcox, Howard A.; and Wood, Charles E.,3,665,397.
Wood, James David London Hedley, to National Research Development Corporation. Control circuit for neutron generator tube. 3,664,960, Cl. 250-84.5
Worcester, Joseph A., to General Electric Company. Station disengagement and sensitivity circuit for scan tuned radio receivers. 3,665,319, Cl. 325-470.000
Work, Lyall Campbell: *See—*
White, Arnold George; Smith, Thomas Edward; Work, Lyall Campbell; and Miller, Willard Wallace,3,664,929.
Worner, Howard Knox, to Conzinc Riotinto of Australia Limited. Reverberatory smelting of copper concentrates. 3,664,828, Cl. 75-73.
Worthington Corporation: *See—*
Biheller, Hans J., 3,664,759.
Zehr, Richard M.; Mott, James; and Schlimgen, Lawrence, 3,665,399.
Worthington Corporation (Worthington Compressor and Engine International Division): *See—*
Klessig, Ernst F., 3,664,435.
Wowk, Anatole, to M&T Chemicals Inc. Organo (halo)disulfur tin derivatives and the process of preparing the same. 3,665,025, Cl. 260-429.7
Wrabel, James A.: *See—*
Jachimek, Thomas P.; and Wrabel, James A.,3,665,208.
Wray, Gary Q.; and Petty, George E., to Halliburton Company. Method and apparatus for testing wells. 3,664,415, Cl. 166-0.500
Wright, Archibald N.; and Merrill, Richard C., to General Electric Company. Removal of organic polymeric films from a substrate. 3,664,899, Cl. 156-8.
Wright, Archibald N.; and Merrill, Richard C., to General Electric Company. Capacitors having a photopolymerized dielectric film. 3,665,269, Cl. 317-258.000
Wright, Donald A.: *See—*
Elder, James T.; and Wright, Donald A.,3,665,449.
Wright, John H., to General Electric Company. Corrosion-inhibited silicone grease. 3,664,953, Cl. 252-18.
Wright, Maurice James, to Lucas, Joseph, (Industries) Limited. Battery charging systems for use in road vehicles. 3,665,501, Cl. 320-39.000
Wrightway Engineering Co.: *See—*
Jatho, George W.; and Kint, Louis F., 3,664,589.
Wyatt, Shelford S. Rigid pipe laying apparatus. 3,664,141, Cl. 61-72.500
Wycech, Casimir E. Combined crash pad and air bag for motor vehicles. 3,664,682, Cl. 280-150.0ab
Xerox Corporation: *See—*
Amidon, Alan B.; Sankus, Joseph G.; Petruzzella, Nicholas L.; and Ewing, Joan R., 3,664,834.
Donalies, Daniel J., 3,664,297.
Jelfo, Raymond L., 3,664,941.
Jordan, William E., 3,664,204.
Joseph, Robert John, 3,664,300.
Mc Pherson, Donald F., 3,664,663.
Xodar Corporation: *See—*
Snow, John F.; and Clough, Roy L., Jr., 3,664,647.
Yabu, Toshiomi: *See—*
Yano, Osahiko; Nakamura, Takahiro; and Yabu, Toshiomi,3,665,098.
Yakovleva, Antonina Karpovna: *See—*
Menyailo, Anatoly Tikhonovich; Pospelov, Mikhail Valerievich; Kaliko, Olga Romanovna; Pokrovskaya, Inna Evgenievna; Fedorova, Valentine Vsevolodovna; Shilnikova, Albina Georgievna; Yakovleva, Antonina Karpovna; and Narozhenko, Tamara Georgievna,3,664,810.
Yamada, Tadashi: *See—*
Yamashita, Akio; and Yamada, Tadashi,3,665,262.
Yamamoto, Mititaka; Kawahara, Kazuhiro; and Morita, Tadao, to Omron Tateisi Electronics Co. Identification system. 3,665,162, Cl. 235-61.7
Yamanouchi Pharmaceutical Co., Ltd.: *See—*
Murakami, Masuo; Iwanami, Masaru; Kubo, Kazuo; Sano, Kenji; Kochiya, Masahiro; and Arima, Hideki, 3,665,037.
Yamasaki, Nobuyuki: *See—*
Sonenberg, Martin; and Yamasaki, Nobuyuki,3,664,925.
Yamashita, Akio; and Yamada, Tadashi, to Matsushita Electric Industrial Co., Ltd. Semiconductor pressure-electric transducer including a semiconductor element having a deep level impurity and a semiconductor pressure transmitting plate. 3,665,262, Cl. 317-234.00r
Yamauchi Rubber Industry Co., Ltd.: *See—*
Sasaki, Kenkichi; and Saikawa, Hisashi, 3,665,355.
Yamauchi, Toshio, to Kabushiki Kaisha Meikiseisakusho. Blank sheet feeding device. 3,664,524, Cl. 214-16.600
Yano, Masamitsu: *See—*
Ishimatsu, Tsuyoshi; Ito, Takashi; Yano, Masamitsu; Takeda, Hajime; and Nagano, Kentaro,3,664,765.
Yano, Osahiko; Nakamura, Takahiro; and Yabu, Toshiomi, to Matsushita Electric Industrial Co., Ltd. Unit for controlling tension of magnetic tape. 3,665,098, Cl. 178-6.60p
Yarbrough, Kenneth A. Test apparatus for determining continuity paths in a multi-terminal arrangement. 3,665,299, Cl. 324-51.
Yasenchak, Richard W.; Schomer, Raymond A.; and Harper, Ernest V., to General Motors Corporation. Six-axis manipulator. 3,665,148, Cl. 219-125.
Yastrov, Henry, to Jerrold Electronics Corporation. Push-pull amplifier. 3,665,333, Cl. 330-53.
Yates, Kenneth P., to Union Oil Company of California. Apparatus for determining magnetic susceptibility in a controlled chemical and thermal environment. 3,665,297, Cl. 324-34.
Yehl, Frank A., to Dresser Industries, Inc. Split housing with improved seal. 3,664,674, Cl. 277-66.
Yeshiva University: *See—*
Mattis, Daniel C., 3,664,726.
Yomiyama, Agira: *See—*
Seko, Maomi; Yomiyama, Agira; Takahashi, Yasunobu; Seta, Shigetoshi; and Nakagawa, Koji,3,664,936.
Yonezu, Hisashi, to Nippondenso Kabushiki Kaisha. Cooler control system for automobile coolers. 3,664,148, Cl. 62-133.
York, James M. Fire escape apparatus. 3,664,457, Cl. 182-70.000
Yoshikawa, Yoshio; Kondo, Hiroshi; Sugio, Akitoshi; and Kato, Tomotake, to Mitsubishi Edogawa Kagaku Kabushiki Kaisha. Apparatus for treating a mixture. 3,664,035, Cl. 34-92.
Yoshioka, Yoshiro: *See—*
Kawai, Hidetoshi; Iizuka, Hajime; Shinkai, Takuo; and Yoshioka, Yoshiro,3,665,398.
Youmans, Arthur H., to Dresser Industries, Inc. Thermal neutron activation radioactivity logging method. 3,665,195, Cl. 250-83.30r
Young, Jerry W., to Phillips Petroleum Company. Apparatus for sealing paperboard containers. 3,664,901, Cl. 156-443.
Younger, Thomas Edward. Water closet cistern. 3,663,969, Cl. 4-46.
Youngquist, Mary J., to Eastman Kodak Company. Photographic product, composition and process comprising an anhydro dihydro amino reductone developing agent. 3,664,835, Cl. 96-3.
Yukami, Noboru; Otani, Hiroshi; and Kurokawa, Hideo, to Matsushita Electric Industrial Co., Ltd.Stress sensitive semiconductor element having an $N^{\circ}PP$ or $P^{\circ}NN$ junction. 3,665,264, Cl. 317-235.
Yuta, Koichi, to Olympus Optical Co., Ltd. Objective having a high resolving power. 3,664,728, Cl. 350-214.
Zagulina, Sofia Stepanovna: *See—*
Shtin, Lev Mikhailovich; Grebnev, Nikolai Feodosovich; Satovskaya, Ljudmila Sergeevna; Rasseikin, Mikhail Grigorievich; Khirdzhiev, Sergei Grigorievich; Perevozchikov, Evgeny Titovich; Zagulina, Sofia Stepanovna; Duda, Vladimir Nikolaevich; and Karasev, Mikhail Andreevich,3,664,168.
Zaidener, Kitty. Locking mechanisms. 3,664,164, Cl. 70-202.000
Zajic, Vladislav, to Institut de Recherche de l'Hydro Quebec Varennes. High voltage direct current circuit breaker. 3,665,249, Cl. 317-11.00c
Zastrow, Virgil A., to Caterpillar Tractor Co. Turbine housing with two inlet passages. 3,664,761, Cl. 415-205.
Zaubitzer, Richard, to Siemens Aktiengesellschaft. Opto-electronic timing switch. 3,665,200, Cl. 250-217.
Zdroik, Melvin M. Tree seat. 3,664,460, Cl. 182-187.000
Zechlin, Richard: *See—*
Henderson, Robert M.; Zechlin, Richard; and Miller, Lowell E.,3,665,169.
Zehr, Richard M.; Mott, James; and Schlimgen, Lawrence, to Worthington Corporation. Monitoring and display system for multi stage compressor. 3,665,399, Cl. 340-152.00r
Zenith Radio Corporation: *See—*
Godawski, Theodore J., 3,665,288.
Zerkle, Ronald D., 1/2 to Jeffries, Neal P. Cooling system for cutting tool and the like. 3,664,412, Cl. 165-1.
Ziegler, William E.: *See—*
Rupert, Samuel J.; and Ziegler, William E.,3,665,063.
Zimmerman, Walter H.: *See—*
Winston, John M.; and Zimmerman, Walter H.,3,665,389.
Zimmerrman, Morris: *See—*
Grabner, Roy W.; Zimmerrman, Morris; Subjack, William J.; and Veber, Daniel F.,3,664,926.
Zintel, James F., to Jenn-Air Corporation. Method of placing a mobile home on a foundation. 3,664,082, Cl. 52-742.000
Zoutte, Arnold A.: *See—*
Mulkey, Owen R.; Kleingartner, Charles A.; and Zoutte, Arnold A.,3,665,458.
Zucca, Marc Edouard; and Filippi, Jean-Paul, said Zucca assor. of 1/3 to Chantiers Navals de la Ciotat. Pneumatic logical relays system for remote controlling and monitoring a thermal engine. 3,664,123, Cl. 60-16.

LIST OF PLANT PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 23RD DAY OF MAY, 1972

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Barenbrug, Josephur J., and C. W. H. M. Schaepman, to Barenbrug's Zaadhandel N.V., Bluegrass plant. 3,186, 5–23–72, Cl. 88.
Barenbrug's Zaadhandel N.V.: *See*—
Barenbrug, Josephur J., and Schaepman. 3,186.
Bearss, John R., to Wight Nurseries, Inc. Ilex plant. 3,187, 5–23–72, Cl. 65.
Duffett, William E.: *See*—
Jessel, Walter H., Jr., and Duffett. 3,183.
Jessel, Walter H., Jr., and Duffett. 3,184.
Jessel, Walter H., Jr., and Duffett. 3,185.
Jessel, Walter H., Jr., and Duffett. 3,189.
Jessel, Walter H., Jr., and Duffett. 3,191.
Ecke, Paul, to Paul Ecke, Inc. Poinsettia plant. 3,196, 5–23–72, Cl. 86.
Ecke, Paul, Inc.: *See*—
Ecke, Paul. 3,196.
Jessel, Walter H., Jr., and W. E. Duffett, to Yoder Brothers, Inc. Chrysanthemum plant. 3,183, 5–23–72, Cl. 79.
Jessel, Walter H., Jr., and W. E. Duffett, to Yoder Brothers, Inc. Chrysanthemum plant. 3,184, 5–23–72, Cl. 80.
Jessel, Walter H., Jr., and W. E. Duffett, to Yoder Brothers, Inc. Chrysanthemum plant. 3,185, 5–23–72, Cl. 79.
Jessel, Walter H., Jr., and W. E. Duffett, to Yoder Brothers, Inc. Chrysanthemum plant. 3,189, 5–23–72, Cl. 74.
Jessel, Walter H., Jr., and W. E. Duffett, to Yoder Brothers, Inc. Chrysanthemum plant. 3,191, 5–23–72, Cl. 78.
Motzkau, Henry W., to Yoder Brothers, Inc. Azalea plant. 3,188, 5–23–72, Cl. 57.
Nakamura, Clifford S., M., and G.: said M. Nakamura assignor to said C. S. Nakamura, and G. Apple tree. 3,182, 5–23–72, Cl. 35.
Nakamura, George: *See*—
Nakamura, Clifford S., M., and G. 3,182.
Nakamura, Misuyo: *See*—
Nakamura, Clifford S., M., and G. 3,182.
Pan-American Plant Co.: *See*—
Shoesmith, Leonard H. 3,192.
Shoesmith, Leonard H. 3,194.
Shoesmith, Leonard H. 3,195.
Schaepman, Cornelis W. H. M.: *See*—
Barenbrug, Josephur J., and Schaepman. 3,186.
Shoesmith, Leonard H., to Pan-American Plant Co. Chrysanthemum plant (Polar Beauty). 3,192, 5–23–72, Cl. 77.
Shoesmith, Leonard H., to Pan-American Plant Co. Chrysanthemum plant (Onward). 3,194, 5–23–72, Cl. 79.
Shoesmith, Leonard H., to Pan-American Plant Co. Chrsyanthemum plant (Eldorado). 3,195, 5–23–72, Cl. 78.
Straw, William T. Ornamental pear tree. 3,193, 5–23–72, Cl. 36.
Wight Nurseries, Inc.: *See*—
Bearss, John R. 3,187.
Wilfong, Harry B., to Yoder Brothers, Inc. Chrysanthemum plant. 3,190, 5–23–72, Cl. 77.
Yoder Brothers, Inc.: *See*—
Jessel, Walter H., Jr., and Duffett. 3,183.
Jessel, Walter H., Jr., and Duffett. 3,184.
Jessel, Walter H., Jr., and Duffett. 3,185.
Jessel, Walter H., Jr., and Duffett. 3,189.
Jessel, Walter H., Jr., and Duffett. 3,191.
Motzkau, Henry W. 3,188.
Wilfong, Harry B. 3,190.

LIST OF DESIGN PATENTEES

Adler, James S., and J. T. Dolby, to Standard Oil Co. Tumbler. 223,678, 5–23–72, Cl. D36—8.
Akahori, Hiroshi: *See*—
Nishino, Seiichi, Kato, and Akahori. 223,669.
Aldape, John. Garbage can holder. 223,682, 5–23–72, Cl. D49—939.
American Play-World, Inc.: *See*—
Johnson, Roland W. 223,674.
Appel, Mel: *See*—
Schnur, Martin and Appel. 223,688.
Berg, David E. Pipette storage rack. 223,661, 5–23–72, Cl. D16—1.
Bertolino, August U.: *See*—
Forsty, William A., Crookston, and Bertolino. 223,671.
Bixler, Kenneth D.: *See*—
Reifers, Richard F., and Bixler.223,653–9.
Bortzfield, Frank E. Nightstick. 223,663, 5–23–72, Cl. D22—99.
Braun, Samuel: *See*—
Jaffe, Martin A., Northrop, and Braun. 223,652.
Jaffe, Martin A., Northrup, and Braun. 223,692.
Chi, Yiu Dak, to Forda Mfg. Co. Ltd. Liquid dispenser. 223,693, 5–23–72, Cl. D94—3.
Coalson, Thomas E. Fishing line guide. 223,662, 5–23–72, Cl. D22—24.
Collie, Alberto W., to Oceanology Systems Design. Aquarium or similar article. 223,673, 5–23–72, Cl. D30—6.
Crookston, Ronald W.: *See*—
Forsty, William A., Crookston, and Bertolino. 223,671.
Diamond International Corp.: *See*—
Reifers, Richard F., and Bixler. 223,653–9.
DiPierro, Michael A.: *See*—
DiPierro, Michael J., M. A., and Mastrovito. 223,667.
DiPierro, Michael J., M. A., and D. P. Mastrovito, to Standard Oil Co. Portable sink unit. 223,667, 5–23–72, Cl. D23—58.
Dolby, John T.: *See*—
Adler, James S., and Dolby. 223,678.
Eisele, Charles W., to H. C. Price Co. Coating flaw detector. 223,665, 5–23–72, Cl. D26—1.
Eisele, Charles W., to H. C. Price Co. Coating holiday detector. 223,666, 5–23–72, Cl. D26—1.
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General Mills Fun Group, Inc.: *See*—
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Greenberg, Allen: *See*—
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Hitachi, Ltd.: *See*—
Nishino, Seiichi, Kato, and Akahori. 223,669.
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Learned, Rosalie C.: *See*—
Learned, Addison W., III and R. C. 223,683.
Magic Marker Corp.: *See*—
Schnur, Martin and Appel. 223,688.
Mastrovito, Donald P.: *See*—
DiPierro, Michael J., M. A., and Mastrovito. 223,667.
McKenna, Walter J. Bookmark. 223,694, 5–23–72, Cl. D97—2.
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Northrop, George S.: *See*—
Jaffe, Martin A., Northrop, and Braun. 223,652.
Jaffe, Martin A., Northrup, and Braun. 223,692.
Oceanology Systems Design: *See*—
Collie, Alberto W. 223,673.

Pareja, Ramon: *See*—
Sadler, Harry J., and Pareja. 223,686.
Petal Corp., The: *See*—
Newman, Elizabeth. 223,691.
Price, H. C., Co.: *See*—
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Hancock, Glen C., and Young. 223,660.
Sjoholm, Hans, to Telefonaktiebolaget LM Ericsson. Picture telephone. 223,672, 5–23–72, Cl. D26—14.
Standard Oil Co.: *See*—
Dipierro, Michael J., M. A., and Mastrovito. 223,667.
Adler, James S., and Dolby. 223,678.
Svenska Ackumulator Aktiebolaget Jungner: *See*—
Ulrich, Theodore. 223,668.
Telefonaktiebolaget LM Ericsson: *See*—
Sjoholm, Hans. 223,672.
Tsunokawa, Kiyoo, and Z. Fukushima, to Hitachi Cable, Ltd., and Japan Power Safety Device M.F.G. Co., Ltd. Earth bar. 223,664, 5–23–72, Cl. D26—1.
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CLASS 2
14N 3,663,959
18 3,663,960
153 3,663,961
224A 3,663,962
237 3,663,963
243R 3,663,964

CLASS 3
1 3,663,965
3,663,966
15 3,663,967
36 3,663,968

CLASS 4
46 3,663,969
111 3,663,970
173 3,663,971

CLASS 5
82 3,663,972
348 3,663,973

CLASS 8
116.4 3,663,974
138 3,664,805
142 3,664,806
158 3,663,975

CLASS 9
6 3,663,976

CLASS 10
26 3,663,977

CLASS 12
133B 3,663,978

CLASS 13
9 3,665,080
3,665,085
3,665,488
12 3,665,081
26 3,665,082
3,665,083
31 3,665,084

CLASS 15
74 3,663,979
215 3,663,980
225 3,663,981
257 3,663,982
321 3,663,984
353 3,663,985

CLASS 16
7 3,663,986
87.2 3,663,988
128 3,663,987
147 3,663,989
178 3,663,990

CLASS 17
11 3,663,991

CLASS 19
80R 3,663,993
281 3,663,992

CLASS 21
2.5 3,664,807

CLASS 23
56 3,664,808
141 3,664,809
187 3,664,810
204 3,664,811
207 3,664,812
209.1 3,664,813
258.5 3,664,814
312R 3,664,815

CLASS 24
11P 3,663,994
74 3,663,995
205.11 3,663,996

CLASS 29
25.14 3,663,997
26A 3,663,998
44 3,663,999
156.4R 3,664,001
159.01 3,664,000
196.2 3,664,816
200D 3,664,002
200R 3,664,003
203D 3,664,004
211D 3,664,005
212D 3,664,006
271 3,664,007
407 3,664,016
420 3,664,008
429 3,664,009
526 3,664,010
3,664,011
596 3,664,017
597 3,664,012
611 3,664,013
622 3,664,014
625 3,664,015
629 3,664,018

CLASS 30
41 3,664,019
142 3,664,020
272 3,664,021

CLASS 32
2 3,664,022
14E 3,664,023
22 3,664,024

CLASS 33
27C 3,664,025
137 3,664,026
174B 3,664,028
174R 3,664,027
180R 3,664,029
184.5 3,664,030
185 3,664,031
207R 3,664,032

CLASS 34
12 3,664,033
92 3,664,035
225 3,664,034

CLASS 35
6 3,664,036
9B 3,664,037
10.2 3,665,086
17 3,664,038
3,665,087
19A 3,664,039

CLASS 36
25R 3,664,040
42 3,664,041
71 3,664,043

CLASS 37
47 3,664,042
142R 3,664,044

CLASS 38
77.5 3,664,045
143 3,664,046

CLASS 40
28R 3,664,047
32 3,664,050
65 3,664,048
124.1 3,664,049
359 3,664,051

CLASS 42
1L 3,664,052

CLASS 43
19 3,664,054
43.14 3,664,053

CLASS 44
47 3,664,817

CLASS 46
45 3,664,055
74A 3,664,056
90 3,664,058
167 3,664,059
232 3,664,060

CLASS 47
1.2 3,664,061
34.13 3,664,062
39 3,664,063

CLASS 48
180R 3,664,818

CLASS 51
100R 3,664,065
165TP 3,664,066
209 3,664,068
277 3,663,983
289R 3,664,067
295 3,664,819
402 3,664,064
800 3,664,088

CLASS 52
2 3,664,069
4 3,664,070
15 3,664,071
63 3,664,072
85 3,664,147
127 3,664,073
173 3,664,075
264 3,664,076
283 3,664,077
293 3,664,078
479 3,664,079
3,664,080
540 3,664,081
742 3,664,082

CLASS 53
53 3,664,083
59R 3,664,084
112A 3,664,086
112R 3,664,085
163 3,664,087
180 3,664,088
199 3,664,089
258 3,664,090

CLASS 55
29 3,664,091
112 3,664,092
174 3,664,093
223 3,664,094
387 3,664,095
466 3,664,096

CLASS 56
1 3,664,097
10.4 3,664,057
13.3 3,664,099
13.9 3,664,098
14.6 3,664,100
220 3,664,101
295 3,664,102
298 3,664,103
332 3,664,104
370 3,664,105
3,664,106
400 3,664,107

CLASS 57
34AT 3,664,108
34R 3,664,109
77.3 3,664,110
105 3,664,111
120 3,664,112
125 3,664,113
140R 3,664,114
156 3,664,115

CLASS 58
23 3,664,116
35W 3,664,117
50R 3,664,118
58 3,664,119
3,664,120

CLASS 59
84 3,664,121
85 3,664,122

CLASS 60
16 3,664,123
39.28 3,664,124
51 3,664,125
52HD 3,664,126
53A 3,664,128
53R 3,664,127
3,664,129
54.5P 3,664,130
220 3,664,131
3,664,132
255 3,664,133
274 3,664,134
310 3,664,135

CLASS 61
1 3,664,136
11 3,664,137
45D 3,664,138
53.74 3,664,139
64 3,664,140
72.4 3,664,142
72.5 3,664,141

CLASS 62
3 3,664,143
3,664,144
58 3,664,145
63 3,664,146
85 3,664,147
133 3,664,148
201 3,664,149
234 3,664,150

CLASS 64
1 3,664,151
8 3,664,152
31 3,664,153

CLASS 65
99A 3,664,820

CLASS 66
86 3,664,154
115 3,664,155
176 3,664,156
190 3,664,157

CLASS 68
5D 3,664,158
205R 3,664,159
224 3,664,160

CLASS 69
30 3,664,161
46 3,664,162

CLASS 70
58 3,664,163
202 3,664,164
292 3,664,231

CLASS 71
67 3,664,821
86 3,664,822
111 3,664,823

CLASS 72
168 3,664,165
205 3,664,166
250 3,664,074
251 3,664,167
265 3,664,168
278 3,664,169
307 3,664,170
344 3,664,171
350 3,664,172
424 3,664,173
441 3,664,174

CLASS 73
1D 3,664,175
4R 3,664,176
17A 3,664,177
53 3,664,178
67.2 3,664,179
67.6 3,664,180
71.6 3,664,181
93 3,664,182
133 3,664,183
136A 3,664,184
136R 3,664,185
139 3,664,186
141A 3,664,187
150 3,664,188
185 3,664,189
194EM 3,664,191
194B 3,664,190
336.5 3,664,192
368 3,664,193
422GC 3,664,194
432R 3,664,195
517B 3,664,196

CLASS 74
1.5 3,664,197
3.54 3,664,198
5.22 3,664,200
5.6 3,664,199
6 3,664,201
18.1 3,664,202
55 3,664,203
219 3,664,204
224 3,664,205
230.17E 3,664,206
242.15 3,664,208
337.5 3,664,207
551.3 3,664,209
753 3,664,210

CLASS 75
.5R 3,664,824
10 3,664,825
50 3,664,826
51 3,664,827
73 3,664,828
108 3,664,829
124 3,664,830
166D 3,664,832
166R 3,664,831

CLASS 81
3R 3,664,211
52.5 3,664,212
91R 3,664,213
130 3,664,214

CLASS 82
2.5 3,664,215
38 3,664,216

CLASS 83
49 3,664,217
81 3,664,218
89 3,664,219
170 3,664,220
196 3,664,221
205 3,664,222
368 3,664,223

CLASS 84
1.01 3,664,224
3,665,088
3,665,089
1.03 3,665,090
1.26 3,665,091
351 3,665,092
484 3,664,225
487 3,665,093

CLASS 85
61 3,664,226

CLASS 90
1 3,664,227
11A 3,664,228
13.1 3,664,230
18 3,664,229

CLASS 91
36 3,664,232
290 3,664,233
363 3,664,234
387 3,664,235

CLASS 92
26 3,664,236
38 3,664,237

CLASS 93
8R 3,664,238
58.1 3,664,240
80 3,664,239

CLASS 94
10 3,664,241
22 3,664,242

CLASS 95
10CD 3,664,244
3,664,245
10C 3,664,243
3,664,246
11R 3,664,247
12.2 3,664,248
13 3,664,249
44C 3,664,250
59 3,664,251
62 3,664,252

CLASS 96
1 3,664,833
1.4 3,664,834
3 3,664,835
35 3,664,836
38.3 3,664,837
56 3,664,838
82 3,664,839
91 3,664,840
100 3,664,841
114.1 3,664,842
116 3,664,843

CLASS 98
36 3,664,253
3,664,254
115K 3,664,255

CLASS 99
18 3,664,844
57 3,664,845
83 3,664,846
3,664,847
3,664,848
107 3,664,849
157 3,664,850
163 3,664,851
425 3,664,256
427 3,664,257

CLASS 100
214 3,664,258

CLASS 101
99 3,664,259
132 3,664,260
177 3,664,261

CLASS 102
56 3,664,262
65.2 3,664,263
73R 3,664,264

CLASS 104
8 3,664,265
25 3,664,266
96 3,664,267
148SS 3,664,268

CLASS 105
199C 3,664,269
377 3,664,270

CLASS 106
1 3,664,852
56 3,664,853
90 3,664,854
212 3,664,855
278 3,664,856

CLASS 108
51 3,664,271
53 3,664,272
3,664,273
144 3,664,274
150 3,664,275

CLASS 109
29 3,664,276

CLASS 110
8A 3,664,277
8R 3,664,278

CLASS 111
80 3,664,279

CLASS 112
3R 3,664,280
20 3,664,281
103 3,664,288
121.15 3,664,282
3,664,283
152 3,664,284

CLASS 114
.5F 3,664,285
.5T 3,664,286
65A 3,664,287
67A 3,664,289

CLASS 115
20 3,664,290

CLASS 116
28 3,664,291
114 3,664,292

CLASS 117
2TC 3,664,869
17.5 3,664,857
36.8 3,664,858
46CG 3,664,859
47A 3,664,860
93.31 3,664,861
100B 3,664,862
119.8 3,664,864
160R 3,664,865
161KP 3,664,863
201 3,664,866
3,664,867
212 3,664,868

CLASS 118
5 3,664,293
7 3,664,294
9 3,664,295
246 3,664,296
627 3,664,297
637 3,664,298
3,664,299
3,664,300

CLASS 119

5	3,664,301
14.14	3,664,306
18	3,664,302
51	3,664,303
61	3,664,304
72	3,664,305

CLASS 122

1	3,664,307
149	3,664,308
336	3,664,309
379	3,664,310

CLASS 123

32EA	3,664,311
90.19	3,664,312
119B	3,664,314
119R	3,664,313
120	3,664,315
124R	3,664,316
139AL	3,664,318
139BG	3,664,317
140MC	3,664,319

CLASS 125

35	3,664,320

CLASS 126

9R	3,664,321
25A	3,664,322
42	3,664,323
113	3,664,324
121	3,664,325
200	3,664,326

CLASS 128

1.4	3,664,327
2B	3,664,328
2.1R	3,664,329
18	3,664,330
24.2	3,664,332
51	3,664,331
52	3,664,333
57	3,664,334
146.6	3,664,335
158	3,664,336
194	3,664,337
214C	3,664,339
220	3,664,338
249	3,664,340
271	3,664,341
276	3,664,342
284	3,664,343
303.1	3,664,344
335	3,664,345
355	3,664,346
404	3,664,347

CLASS 130

27HF	3,664,349
27JT	3,664,348

CLASS 131

10A	3,664,350
110	3,664,351
264	3,664,352

CLASS 132

79G	3,664,353

CLASS 134

3	3,664,870
6	3,664,871
	3,664,872
61	3,664,354
143	3,664,355

CLASS 136

86C	3,664,873
89	3,664,874
134R	3,664,875
160	3,664,876
171	3,664,877
178	3,664,878
182	3,664,879
205	3,664,880
	3,664,881
234	3,664,882

CLASS 137

1	3,664,356
2	3,664,357
14	3,664,358
81	3,664,359
81.5	3,664,360
98	3,664,361
102	3,664,362
183	3,664,363
205	3,664,364
206	3,664,365
209	3,664,366
344	3,664,367
480	3,664,368
484.4	3,664,369
487.5	3,664,370
516.29	3,664,371
552	3,664,372
565	3,664,373
596.2	3,664,374
614.04	3,664,375
625.68	3,664,376
625.69	3,664,377
635	3,664,378

CLASS 138

143	3,664,379

CLASS 139

12	3,664,380
159	3,664,382
317	3,664,383
420	3,664,381

CLASS 140

92.94	3,664,384

CLASS 141

12	3,664,385
100	3,664,386
238	3,664,387
284	3,664,388

CLASS 143

6A	3,664,389
32N	3,664,391
32R	3,664,390

CLASS 144

117C	3,664,392
	3,664,393
133R	3,664,394
209A	3,664,395

CLASS 146

78A	3,664,396
117R	3,664,397
129R	3,664,398

CLASS 148

6.14	3,664,885
6.15R	3,664,886
6.16	3,664,887
6.2	3,664,883
6.27	3,664,888
6.3	3,664,884
11.5A	3,664,890
11.5R	3,664,889
31.57	3,664,892
175	3,664,893
186	3,664,894
187	3,664,895
	3,664,896

CLASS 149

38	3,664,897
41	3,664,898

CLASS 150

1.5R	3,664,399

CLASS 151

22	3,664,400

CLASS 152

209	3,664,402
330	3,664,403
361	3,664,404
375	3,664,405

CLASS 156

8	3,664,899
145	3,664,401
174	3,664,900
443	3,664,901
506	3,664,903
580	3,664,902

CLASS 161

50	3,664,904
59	3,664,905
68	3,664,906
89	3,664,907
113	3,664,908
141	3,664,909
147	3,664,910
160	3,664,911
161	3,664,912
164	3,664,915
167	3,664,913
173	3,664,914
	3,664,916
	3,664,917

CLASS 162

19	3,664,918
	3,664,919

CLASS 164

161	3,664,406
165	3,664,407
241	3,664,408
260	3,664,409
303	3,664,410
312	3,664,411

CLASS 165

1	3,664,412
4	3,664,413
26	3,664,414

CLASS 166

.5	3,664,415
65	3,664,416
216	3,664,417
245	3,664,418
274	3,664,419
278	3,664,421
280	3,664,420
283	3,664,422
297	3,664,423
303	3,664,424
	3,664,425
308	3,664,426
313	3,664,427

CLASS 168

4	3,664,428

CLASS 169

2R	3,664,429
23	3,664,430

CLASS 171

58	3,664,431

CLASS 172

19	3,664,432
450	3,664,433
536	3,664,434

CLASS 173

17	3,664,435
43	3,664,436

CLASS 174

65R	3,665,094
107	3,665,095
	3,665,096

CLASS 175

5	3,664,437
6	3,664,438
85	3,664,439
206	3,664,440
215	3,664,441
231	3,664,442
293	3,664,443
323	3,664,444

CLASS 176

1	3,664,920
4	3,664,921
19R	3,664,922
40	3,664,923
78	3,664,924

CLASS 177

45	3,664,445

CLASS 178

6	3,665,097
6.6P	3,665,098
6.6R	3,665,100
	3,665,101
6.7R	3,665,099
18	3,665,102
21	3,665,115
66R	3,665,103
69.5F	3,665,104

CLASS 179

1FS	3,665,106
1G	3,665,105
4	3,665,107
15BL	3,665,108
16E	3,665,109
18EA	3,665,110
37	3,665,116
81C	3,665,111
90B	3,665,113
90K	3,665,489
99	3,665,112
100.1VC	3,665,117
100.2S	3,665,118
100.2T	3,665,119
100.2Z	3,665,114
	3,665,120
100.41K	3,665,123
107BC	3,665,122
107S	3,665,121
115.5DV	3,665,124
146R	3,665,490
170R	3,665,125

CLASS 180

5R	3,664,446
	3,664,447
9.46	3,664,448
9.48	3,664,449
65R	3,664,450
70R	3,664,451
71	3,664,452
101	3,664,453
	3,664,454

CLASS 181

33HC	3,664,455

CLASS 182

62.5	3,664,456
70	3,664,457
102	3,664,458
141	3,664,459
187	3,664,460

CLASS 184

6.16	3,664,461
7D	3,664,462

CLASS 188

1C	3,664,463
5	3,664,464
10	3,664,465
32	3,664,466
71.6	3,664,467
72.2	3,664,468
72.9	3,664,469

CLASS 192

3.57	3,664,470
4R	3,664,471
12R	3,664,472
21.5	3,664,473
56F	3,664,474

CLASS 194

51	3,664,475
58	3,664,476

CLASS 195

29	3,664,925
66A	3,664,926
141	3,664,927

CLASS 197

6.7	3,664,477
17	3,664,478
63	3,664,479
64	3,664,480
133R	3,664,481

CLASS 198

1	3,664,489
20	3,664,482
31AA	3,664,891
32	3,664,483
33AA	3,664,484
78	3,664,485
126	3,664,486
136	3,664,487
139	3,664,488
193	3,664,490
195	3,664,491

CLASS 200

5E	3,665,126
11TW	3,665,127
44	3,665,128
51.07	3,665,129
61.27	3,665,130
67B	3,665,131
83P	3,665,132
148A	3,665,134
148	3,665,133
163	3,665,135
166C	3,665,136
172A	3,665,137

CLASS 202

236	3,664,928

CLASS 203

10	3,664,929
37	3,664,930

CLASS 204

35N	3,664,932
38A	3,664,931
38S	3,664,933
58	3,664,934
67	3,664,935
73A	3,664,936
159.15	3,664,937
180R	3,664,938
	3,664,939
	3,664,940
181	3,664,941
192	3,664,942
	3,664,943
212	3,664,944
228	3,664,945
243R	3,664,946
297R	3,664,947
298	3,664,948

CLASS 206

1R	3,664,492
44	3,664,494
45.14	3,664,493
63.2R	3,664,495
65C	3,664,496
	3,664,497
65S	3,664,498

CLASS 208

65	3,664,949

CLASS 209

73	3,664,499
80.5	3,664,500
273	3,664,501
397	3,664,502
	3,664,503

CLASS 210

35	3,664,950
44	3,664,951
83	3,664,504
242	3,664,505
282	3,664,506
323	3,664,507
391	3,664,509

CLASS 211

41	3,664,510
105.1	3,664,511
113	3,664,512
134	3,664,513
169	3,664,514

CLASS 212

39	3,664,515
46A	3,664,516

CLASS 214

1CM	3,664,517
1Q	3,664,518
6B	3,664,519
7	3,664,520
8.5SS	3,664,522
8.5K	3,664,521
16.1A	3,664,523
16.6	3,664,524
17D	3,664,525
83.1	3,664,526
138R	3,664,527
	3,664,528
140	3,664,529
302	3,664,530
339	3,664,531
356	3,664,532
516	3,664,533
730	3,664,534

CLASS 215

11R	3,664,535
40	3,664,536

CLASS 219

8.5	3,665,138
10.43	3,665,139
10.55	3,665,140
	3,665,141
	3,665,142
	3,665,491
69G	3,665,144
76	3,665,143
119	3,665,145
124	3,665,146
125	3,665,148
131WR	3,665,150
131R	3,665,147
	3,665,149
149	3,665,151
253	3,665,152
279	3,665,153
301	3,665,154
333	3,665,156
335	3,665,155
384	3,665,157
421	3,665,158
497	3,665,159

CLASS 220

2.1R	3,664,537
4E	3,664,538
24	3,664,539
39R	3,664,540
42B	3,664,541
44R	3,664,542
54	3,664,543
60R	3,664,544

CLASS 221

176	3,664,545
259	3,664,547
279	3,664,546

CLASS 222

61	3,664,548
64	3,664,549
129.2	3,664,550
134	3,664,551
144.5	3,664,552
145	3,664,555
183	3,664,553
	3,664,554
385	3,664,556
386	3,664,508
397	3,664,557

CLASS 224

1R	3,664,558
4E	3,664,559
5R	3,664,560

CLASS 226

21	3,664,561
76	3,664,562

CLASS 227

7	3,664,563
100	3,664,564
137	3,664,565

CLASS 228

3	3,664,566
	3,664,567

CLASS 229

1.5B	3,664,568
10	3,664,569
23R	3,664,570
39B	3,664,571
40	3,664,572
	3,664,573
44R	3,664,574
62	3,664,575

CLASS 232

43.2	3,664,576

CLASS 234

15	3,664,577

CLASS 235

60MT	3,665,492
61.1	3,665,160
61.11D	3,665,163
61.11E	3,665,164
61.7B	3,665,161
	3,665,162
92EA	3,665,166
92FL	3,665,167
92T	3,665,165
101	3,664,578
150.1	3,665,172
150.2	3,665,168
151.11	3,665,170
	3,665,493
151.3	3,665,169
152	3,665,171
153	3,665,173
	3,665,174
	3,665,175
156	3,665,494

CLASS 236

44	3,664,579
	3,664,580
80	3,664,581
93	3,664,582

CLASS 238

5	3,664,583
349	3,664,584

CLASS 239

222.21	3,664,585
233	3,664,586
402.5	3,664,587
418	3,664,588
428.5	3,664,589
499	3,664,590
552	3,664,591

CLASS 240

1.3	3,665,176
9R	3,665,177
10.6	3,665,178
41.3	3,665,179

CLASS 241

60	3,664,593
73	3,664,592

CLASS 242

43	3,664,596
60	3,664,594
71.1	3,664,595
75.4	3,664,597
107.3	3,664,598
107.4	3,664,599
	3,664,600
129	3,664,601
131	3,664,602
180	3,664,603
185	3,664,604
189	3,664,605
192	3,664,606
195	3,664,607
204	3,664,608
	3,664,609
210	3,664,610

CLASS 244

42CD	3,664,611
53B	3,664,612
155R	3,664,613

CLASS 248

2	3,664,614
25	3,664,616
27	3,664,615
38	3,664,617
44	3,664,618
51	3,664,619
63	3,664,620
74R	3,664,621
95	3,664,622
188.7	3,664,623
221	3,664,624
223	3,664,625
224	3,664,626
246	3,664,627
350	3,664,628
445	3,664,629

CLASS 249

112	3,664,630

CLASS 250

43.5D	3,665,180
49.5PI	3,665,182
49.5ZC	3,665,181
49.5P	3,665,185
52	3,665,183
60	3,665,184
62	3,665,186
71.5R	3,665,192
83CD	3,665,194
83	3,665,193
83.3PD	3,665,197
83.3D	3,665,187
83.3H	3,665,190
	3,665,196
83.3R	3,665,188
	3,665,195
83.6R	3,665,189
84.5	3,664,960
86	3,665,191
106S	3,665,198
	3,665,199
217R	3,665,200

218 3,665,201
237R 3,665,202

CLASS 251

101 3,664,632
294 3,664,633
333 3,664,634

CLASS 252

8.75 3,664,952
18 3,664,953
32.7E 3,664,954
47.5 3,664,955
49.6 3,664,956
3,664,957
54.6 3,664,958
63.7 3,664,959
99 3,664,961
125 3,664,962
316 3,664,963
364 3,664,964
408 3,664,965
430 3,664,966
431R 3,664,967
437 3,664,968
438 3,664,969
454 3,664,970
455R 3,664,971
3,664,972
3,664,973

CLASS 254

8B 3,664,635
93HP 3,664,636
190R 3,664,637

CLASS 256

32 3,664,739

CLASS 259

4 3,664,638
3,664,639
8 3,664,640
3,664,641
3,664,642
44 3,664,643
164 3,664,644
183 3,664,645

CLASS 260

2P 3,664,974
2.5AJ 3,664,975
2.5BD 3,664,976
4AR 3,664,977
5 3,664,978
18N 3,664,980
18S 3,664,997
22D 3,664,984
27 3,664,981
29.4 3,664,982
29.6HN 3,664,991
29.6H 3,664,987
29.75Q 3,664,983
46.5R 3,664,985
75NK 3,664,979
78R 3,664,986
80.75 3,664,988
82.1 3,664,989
84.1 3,665,062
85.5R 3,664,990
89.5 3,664,992
3,664,993
112B 3,664,994
146T 3,664,995
156 3,664,996
210R 3,664,998
231A 3,664,999
233.3R 3,665,000
239A 3,665,001
239.9 3,665,002
243C 3,665,003
248NS 3,665,004
268BC 3,665,016
287R 3,665,005
289R 3,665,006
306.7 3,665,007
310R 3,665,008
310 3,665,009
326.3 3,665,010
3,665,011
3,665,012
343.2R 3,665,013
343.6 3,665,014
345.9 3,665,015
349 3,665,017
365 3,665,018
374 3,665,019
397.2 3,665,020
397.3 3,665,022
397.45 3,665,021
397.7 3,665,023
429.7 3,665,024
3,665,025
448.8R 3,665,026
3,665,027
462A 3,665,028
465E 3,665,029
488CD 3,665,030
507R 3,665,031
519 3,665,032
524R 3,665,033
533A 3,665,034
537S 3,665,035
556AR 3,665,036
563R 3,665,037
576 3,665,038
602 3,665,039
614R 3,665,040
615A 3,665,041
646 3,665,042
674SA 3,665,046
674N 3,665,043
3,665,044
3,665,045
681 3,665,047
682 3,665,048
683.3 3,665,049
683.62 3,665,050
824 3,665,051
827 3,665,052
836 3,665,053
857UN 3,665,054
862 3,665,055
873 3,665,056
876R 3,665,057
889 3,665,058
897A 3,665,059
897C 3,665,060

CLASS 261

23R 3,664,646
30 3,664,647
41R 3,664,648

CLASS 263

6A 3,664,649
32 3,664,650

CLASS 264

49 3,665,061
89 3,665,063
104 3,665,064
113 3,665,065
117 3,665,066
127 3,665,067
211 3,665,068
219 3,665,069
290T 3,665,070

CLASS 266

1R 3,664,651
34A 3,664,652

CLASS 267

139 3,664,653

CLASS 269

9 3,664,654

CLASS 270

56 3,664,655
58 3,664,656
3,664,657

CLASS 271

9 3,664,658
18 3,664,659
35 3,664,660
36 3,664,661
51 3,664,662
61 3,664,663

CLASS 272

1C 3,664,664
33R 3,664,665
58 3,664,666
83R 3,664,667

CLASS 273

73C 3,664,668
73D 3,664,669
101 3,664,670
131AC 3,664,671

CLASS 274

4D 3,664,672
11R 3,664,673

CLASS 277

66 3,664,674
84 3,664,675
166 3,664,676

CLASS 279

83 3,664,677

CLASS 280

47.2 3,664,678
81R 3,664,679
87.04R 3,664,680
124F 3,664,681
150AB 3,664,682
202 3,664,683
231 3,664,684
486 3,664,685
490 3,664,686
491 3,664,687

CLASS 285

6 3,664,688
18 3,664,689
96 3,664,690
112 3,664,691

CLASS 287

52 3,664,692
111 3,664,693

CLASS 289

18 3,664,694

CLASS 292

54 3,664,695
66 3,664,696
173 3,664,697
201 3,664,698
251.5 3,664,699
256.75 3,664,700

CLASS 293

4 3,664,701

CLASS 294

69R 3,664,702
118 3,664,703

CLASS 296

24R 3,664,704

CLASS 297

445 3,664,705

CLASS 298

1H 3,664,706

CLASS 299

38 3,664,707

CLASS 301

9DN 3,664,708
36R 3,664,709
136 3,664,710

CLASS 303

21BE 3,664,711
21CF 3,664,712
21F 3,664,714
21P 3,664,713

CLASS 305

38 3,664,715

CLASS 307

67 3,665,495
84 3,665,203
88.3 3,665,204
3,665,205
3,665,206
106 3,665,207
3,665,208
117 3,665,211
118 3,665,209
218 3,665,213
221 3,665,214
230 3,665,215
234 3,665,216
235 3,665,217
238 3,665,210
251 3,665,218
3,665,496
252B 3,665,219
252T 3,665,212
254 3,665,220
255 3,665,221
283 3,665,222
293 3,665,223
311 3,665,224

CLASS 308

3.8 3,664,716
15 3,664,717
189A 3,664,718

CLASS 310

8.1 3,665,225
8.3 3,665,226
46 3,665,227
47 3,665,228
52 3,665,229
60 3,665,230
77 3,665,231
3,665,232
234 3,665,233
260 3,665,234

CLASS 312

185 3,664,719
219 3,664,720

CLASS 313

23 3,665,235
55 3,665,236
103 3,665,497
108A 3,665,237
220 3,665,238
318 3,665,239
344 3,665,240
351 3,665,241

CLASS 315

5.35 3,665,242
101 3,665,243
111 3,665,244
3,665,245
169R 3,665,246
205 3,665,247

CLASS 317

4 3,665,248
11C 3,665,249
16 3,665,250
18A 3,665,251
18D 3,665,252
22 3,665,253
68 3,665,255
100 3,665,256
103 3,665,257
132 3,665,258
144 3,665,259
230 3,665,260
3,665,261
234R 3,665,254
3,665,262
235R 3,665,263
3,665,264
3,665,265
3,665,266
258 3,665,267
3,665,268
3,665,269

CLASS 318

6 3,665,270
138 3,665,271
204 3,665,272
227 3,665,273
3,665,498
257 3,665,274
261 3,665,275
318 3,665,276
447 3,665,277
466 3,665,278
571 3,665,279
3,665,499
572 3,665,280
588 3,665,281
596 3,665,500
627 3,665,282
649 3,665,283
696 3,665,284

CLASS 320

2 3,665,285
39 3,665,501

CLASS 321

2 3,665,286
8R 3,665,287
24 3,665,288
28 3,665,502
45R 3,665,289
3,665,503
47 3,665,290

CLASS 323

17 3,665,291
24 3,665,293
48 3,665,292

CLASS 324

16 3,665,294
26 3,665,504
30B 3,665,295
34S 3,665,296
3,665,297
41 3,665,298
51 3,665,299
61P 3,665,301
61R 3,665,300
64 3,665,302
73 3,665,303
77A 3,665,505
85 3,665,304
99D 3,665,305
103P 3,665,506
158D 3,665,307
174 3,665,306
182 3,665,308
186 3,665,309

CLASS 325

21 3,665,310
53 3,665,311
54 3,665,312
55 3,665,313
141 3,665,314
178 3,665,315
308 3,665,316
315 3,665,507
319 3,665,317
446 3,665,508
470 3,665,318
3,665,319
478 3,665,320
3,665,321

CLASS 328

3 3,665,322
14 3,665,323
63 3,665,324
146 3,665,325
151 3,665,326
163 3,665,327

CLASS 329

110 3,665,328

CLASS 330

19 3,665,329
24 3,665,330
28 3,665,331
29 3,665,332
40 3,665,334
53 3,665,333

CLASS 331

94.5 3,665,335
3,665,336
3,665,337
3,665,338
107R 3,665,339
3,665,340
3,665,341
109 3,665,342
113R 3,665,343
116R 3,665,344

CLASS 333

14. 3,665,345
70CR 3,665,346
81A 3,665,347

CLASS 335

68 3,665,348
154 3,665,349
195 3,665,350
216 3,665,351
231 3,665,352
258 3,665,353
295 3,665,354
306 3,665,355

CLASS 336

73 3,665,356
3,665,357
96 3,665,358

CLASS 337

2 3,665,359
100 3,665,360
265 3,665,361
322 3,665,362
361 3,665,363

CLASS 338

32H 3,665,366
180 3,665,364
190 3,665,365

CLASS 339

12V 3,665,509
60R 3,665,368
75MP 3,665,369
3,665,370
90C 3,665,371
91R 3,665,372
95D 3,665,373
101 3,665,374
192R 3,665,375
198E 3,665,376
198G 3,665,377
217S 3,665,378
275T 3,665,367

CLASS 340

5C 3,665,379
6R 3,665,380
8 3,665,381
38L 3,665,382
52E 3,665,385
52F 3,665,383
3,665,384
53 3,665,386
58 3,665,387
3,665,388
60 3,665,389
62 3,665,390
67 3,665,391
3,665,392
146.1AX 3,665,394
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147R 3,665,397
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152R 3,665,399
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173SP 3,665,426
173R 3,665,422
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173 3,665,425
174JA 3,665,428
174TF 3,665,427
174.1MD 3,665,431
174.1A 3,665,438
174.1B 3,665,435
174.1C 3,665,437
174.1E 3,665,434
174.1F 3,665,433
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174.1H 3,665,429
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183 3,665,439
228.2 3,665,440
237S 3,665,441
248R 3,665,442
258A 3,665,443
258D 3,665,511
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261 3,665,445
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279 3,665,447
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321 3,665,451
323 3,665,452
324A 3,665,450
3,665,453
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343 3,665,455
347AD 3,665,456
347DA 3,665,458
3,665,460
347NT 3,665,457
381 3,665,459
409 3,665,461

CLASS 343

5PD 3,665,462
5R 3,665,463
6.5R 3,665,464
7ED 3,665,465
12R 3,665,466
18E 3,665,512
100ME 3,665,467
102 3,665,468
105 3,665,469
106R 3,665,470
112R 3,665,471
175 3,665,472
200 3,665,474
225 3,665,475
701 3,665,476
714 3,665,477
725 3,665,478
726 3,665,479
754 3,665,480
762 3,665,481
765 3,665,482

CLASS 346

1 3,665,483
74ES 3,665,486
74MP 3,665,484
74M 3,665,485
3,665,513

CLASS 350

3.5 3,664,721
3,664,722
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54 3,664,724
160P 3,664,725
160 3,664,726
179 3,664,727
214 3,664,728
281 3,664,729

CLASS 351

6 3,664,730
7 3,664,731
27 3,664,631
39 3,664,732
45 3,664,733
83 3,664,734

CLASS 352

24 3,664,735
84 3,664,736

CLASS 355

18 3,664,737
87 3,664,738

CLASS 356

32 3,664,739
37 3,664,740
74 3,664,741
80 3,664,742
83 3,664,743
88 3,664,744
113 3,664,745
138 3,664,746
140 3,664,747
152 3,664,748
164 3,664,749
167 3,664,750
206 3,664,752
219 3,664,751

CLASS 401

65 3,664,753

CLASS 408

16 3,664,754
159 3,664,755
202 3,664,756

CLASS 415			244	3,664,766	**CLASS 418**			273	3,665,076		3,664,785		3,664,796
53	3,664,757		**CLASS 417**		16	3,664,776			3,665,077	99	3,664,786	214	3,664,797
104	3,664,758		45	3,664,767	117	3,664,778			3,665,078	109	3,664,787	326	3,664,798
121	3,664,759		197	3,664,768	131	3,664,777			3,665,079		3,664,788	389	3,664,799
170A	3,664,760		312	3,664,769	**CLASS 424**			**CLASS 425**			3,664,792	391	3,664,800
205	3,664,761		383	3,664,770	9	3,665,071		4	3,664,779	131	3,664,789	**CLASS 431**	
CLASS 416			410	3,664,771	70	3,665,072		66	3,664,780		3,664,790	3	3,664,802
156	3,664,762		486	3,664,772	79	3,665,073		68	3,664,781	156	3,664,791	69	3,664,803
157	3,664,763		507	3,664,773	248	3,665,074		71	3,664,782	186	3,664,793	183	3,664,804
224	3,664,764		560	3,664,774	272	3,665,075			3,664,783	192	3,664,794	**CLASS 444**	
241	3,664,765		566	3,664,775				78	3,664,784	208	3,664,795	1	3,665,487

CLASSIFICATION OF DESIGNS

D 2—	385	223,650			223,658			223,665	D34—	5	223,674			223,682	D74—	17	223,688
D 4—	25	223,651			223,659			223,666		15	223,675		32	223,681	D80—	8	223,689
D 9—	189	223,652	D13—	1	223,660			223,668			223,676	D52—	6	223,683	D83—	1	223,690
	219	223,653	D16—		223,661		5	223,669	D35—	3	223,677	D55—	1	223,684	D86—	10	223,691
		223,654	D22—	24	223,662		13	223,671	D36—	8	223,678			223,685	D87—	1	223,692
		223,655		99	223,663		14	223,670	D40—	1	223,679	D65—		223,686	D94—	3	223,693
		223,656	D23—	58	223,667			223,672	D49—	30	223,680	D71—		223,687	D97—	2	223,694
		223,657	D26—	1	223,664	D30—	6	223,673									

CLASSIFICATION OF PLANTS

P. —	35	3,182	P. —	65	3,187	P. —		3,192	P. —	79	3,183	P. —		3,194	P. —	86	3,196
P. —	36	3,193	P. —	74	3,189	P. —	78	3,191	P. —		3,185	P. —	80	3,184	P. —	88	3,186
P. —	57	3,188	P. —	77	3,190	P. —		3,195									

GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

1 : 3,664,346	3,664,256	3,664,665	3,665,164	3,664,463	3,664,329
3,664,387	3,664,259	3,664,666	3,665,167	3,664,601	3,664,333
3,664,969	3,664,271	3,664,668	3,665,192	3,664,604	3,664,546
3,665,146	3,664,287	3,664,677	3,665,194	3,664,633	3,664,768
3,665,451	3,664,289	3,664,684	3,665,196	3,664,648	3,664,772
2 : 3,664,334	3,664,294	3,664,688	3,665,197	3,664,756	3,665,108
3,664,829	3,664,305	3,664,689	3,665,209	3,664,975	3,665,227
3 : 3,664,620	3,664,313	3,664,696	3,665,211	3,665,429	3,665,285
4 : 3,664,053	3,664,318	3,664,709	3,665,215	3,665,431	3,665,303
3,664,234	3,664,332	3,664,731	3,665,226	9 : 3,664,016	3,665,367
3,664,389	3,664,339	3,664,744	3,665,236	3,664,099	3,665,386
3,664,683	3,664,361	3,664,755	3,665,241	3,664,231	3,665,509
3,664,893	3,664,369	3,664,757	3,665,247	3,664,301	13 : 3,663,991
3,664,904	3,664,374	3,664,786	3,665,250	3,664,344	3,664,030
3,665,266	3,664,376	3,664,808	3,665,258	3,664,377	3,664,223
3,665,329	3,664,414	3,664,809	3,665,260	3,664,397	3,664,274
3,665,342	3,664,417	3,664,820	3,665,278	3,664,445	3,664,327
3,665,343	3,664,419	3,664,837	3,665,282	3,664,538	3,664,464
3,665,415	3,664,430	3,664,856	3,665,294	3,664,549	3,664,568
3,665,438	3,664,432	3,664,866	3,665,297	3,664,656	3,664,573
5 : 3,664,023	3,664,446	3,664,867	3,665,310	3,664,760	3,664,574
3,664,238	3,664,455	3,664,880	3,665,317	3,664,811	3,665,379
3,664,448	3,664,459	3,664,889	3,665,326	3,664,873	14 : 3,664,825
6 : 3,663,965	3,664,479	3,664,896	3,665,327	3,664,890	16 : 3,664,070
3,663,967	3,664,492	3,664,910	3,665,337	3,664,922	17 : 3,663,963
3,663,980	3,664,499	3,664,913	3,665,356	3,664,924	3,663,964
3,663,988	3,664,504	3,664,921	3,665,358	3,665,061	3,664,027
3,663,990	3,664,514	3,664,923	3,665,374	3,665,131	3,664,058
3,664,002	3,664,515	3,664,928	3,665,394	3,665,217	3,664,062
3,664,007	3,664,519	3,664,939	3,665,397	3,665,245	3,664,063
3,664,018	3,664,536	3,664,940	3,665,404	3,665,336	3,664,068
3,664,021	3,664,550	3,664,971	3,665,405	3,665,348	3,664,088
3,664,029	3,664,552	3,664,972	3,665,417	3,665,373	3,664,107
3,664,032	3,664,557	3,664,973	3,665,419	3,665,381	3,664,177
3,664,045	3,664,560	3,665,051	3,665,422	3,665,406	3,664,214
3,664,055	3,664,567	3,665,088	3,665,433	3,665,441	3,664,229
3,664,073	3,664,578	3,665,096	3,665,434	3,665,475	3,664,230
3,664,076	3,664,582	3,665,097	3,665,437	10 : 3,663,994	3,664,257
3,664,077	3,664,585	3,665,099	3,665,453	3,664,381	3,664,269
3,664,081	3,664,586	3,665,103	3,665,459	3,664,428	3,664,272
3,664,131	3,664,588	3,665,105	3,665,465	3,664,456	3,664,310
3,664,132	3,664,590	3,665,114	3,665,473	3,664,823	3,664,322
3,664,133	3,664,597	3,665,118	3,665,478	3,664,906	3,664,323
3,664,136	3,664,598	3,665,120	3,665,483	3,664,915	3,664,338
3,664,141	3,664,611	3,665,138	3,665,500	3,664,986	3,664,379
3,664,144	3,664,622	3,665,140	3,665,513	3,665,009	3,664,385
3,664,170	3,664,626	3,665,142	8 : 3,663,972	11 : 3,664,185	3,664,434
3,664,171	3,664,628	3,665,145	3,664,006	3,665,469	3,664,457
3,664,199	3,664,629	3,665,151	3,664,042	3,665,481	3,664,466
3,664,249	3,664,653	3,665,152	3,664,043	12 : 3,664,052	3,664,471
3,664,255	3,664,654	3,665,161	3,664,097	3,664,312	3,664,484

3,664,496
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3,664,512
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3,665,502
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18 : 3,664,082
3,664,130
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3,664,264
3,664,270
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3,664,636
3,664,871
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3,665,042
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3,665,223
3,665,318
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19 : 3,664,085
3,664,349
3,664,451
3,664,739
3,665,163
3,665,353
3,665,380
3,665,470

20 : 3,664,074
3,664,220
3,664,279
3,664,314
3,664,685
3,664,717
3,665,050
3,665,450

21 : 3,664,207
3,664,410
3,664,462
3,664,799
3,665,158
3,665,199

22 : 3,663,981
3,664,088
3,664,135
3,664,353
3,664,429
3,664,621
3,664,659
3,665,369

24 : 3,663,989
3,663,998
3,664,182
3,664,239
3,664,336
3,664,371
3,664,487
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3,664,637
3,664,739
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3,664,874
3,664,920
3,665,086
3,665,102
3,665,183
3,665,277
3,665,420
3,665,479
3,665,512

25 : 3,663,983
3,663,984
3,664,039
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3,664,065
3,664,112
3,664,113
3,664,134
3,664,178
3,664,248
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3,664,638
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3,664,707
3,664,714
3,664,718
3,664,725
3,664,803
3,664,819
3,664,832
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3,665,181
3,665,261
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3,665,334
3,665,368
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26 : 3,664,008
3,664,009
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3,664,094
3,664,126
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3,664,181
3,664,194
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3,664,319
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3,664,392
3,664,393
3,664,481
3,664,491
3,664,495
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3,664,599
3,664,640
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3,664,682
3,664,701
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3,664,713
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3,664,774
3,664,791
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3,664,967
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3,665,144
3,665,148
3,665,159
3,665,201
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3,665,425
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27 : 3,664,071
3,664,098
3,664,104
3,664,242
3,664,453
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3,664,494
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28 : 3,665,445
29 : 3,664,394
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3,664,715
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31 : 3,664,302
3,664,367
3,664,556
3,664,710

32 : 3,664,147
33 : 3,664,436
3,664,473
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3,665,402
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34 : 3,663,997
3,664,031
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3,664,190
3,664,253
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35 : 3,664,175
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DESIGN PATENTS

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42 : 223,666
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PLANT PATENTS

6 : 3,196
13 : 3,187

21 : 3,193
37 : 3,190

39 : 03,183
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41 : 3,191
3,182

55 : 3,188

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